The Way We Live

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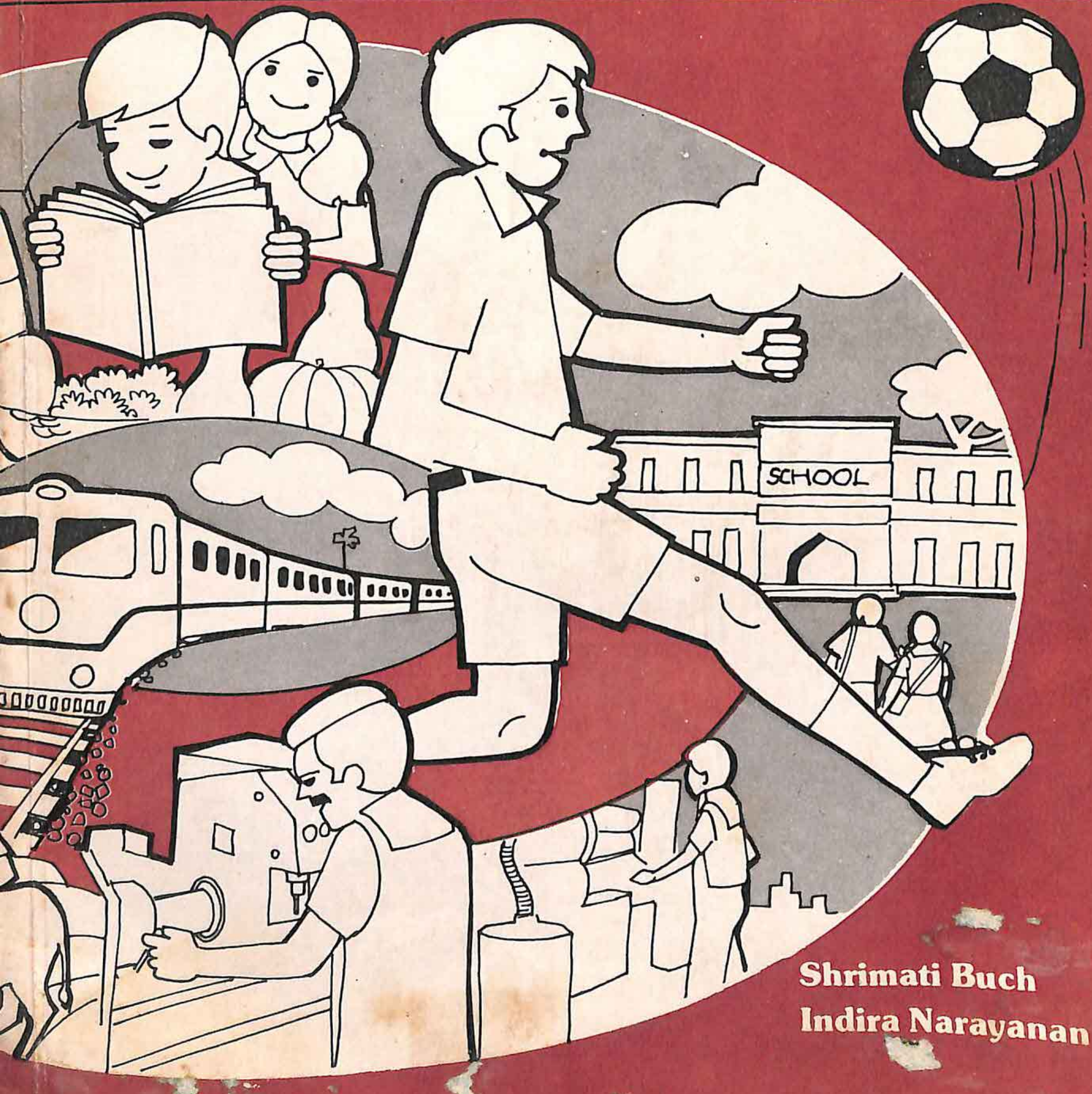
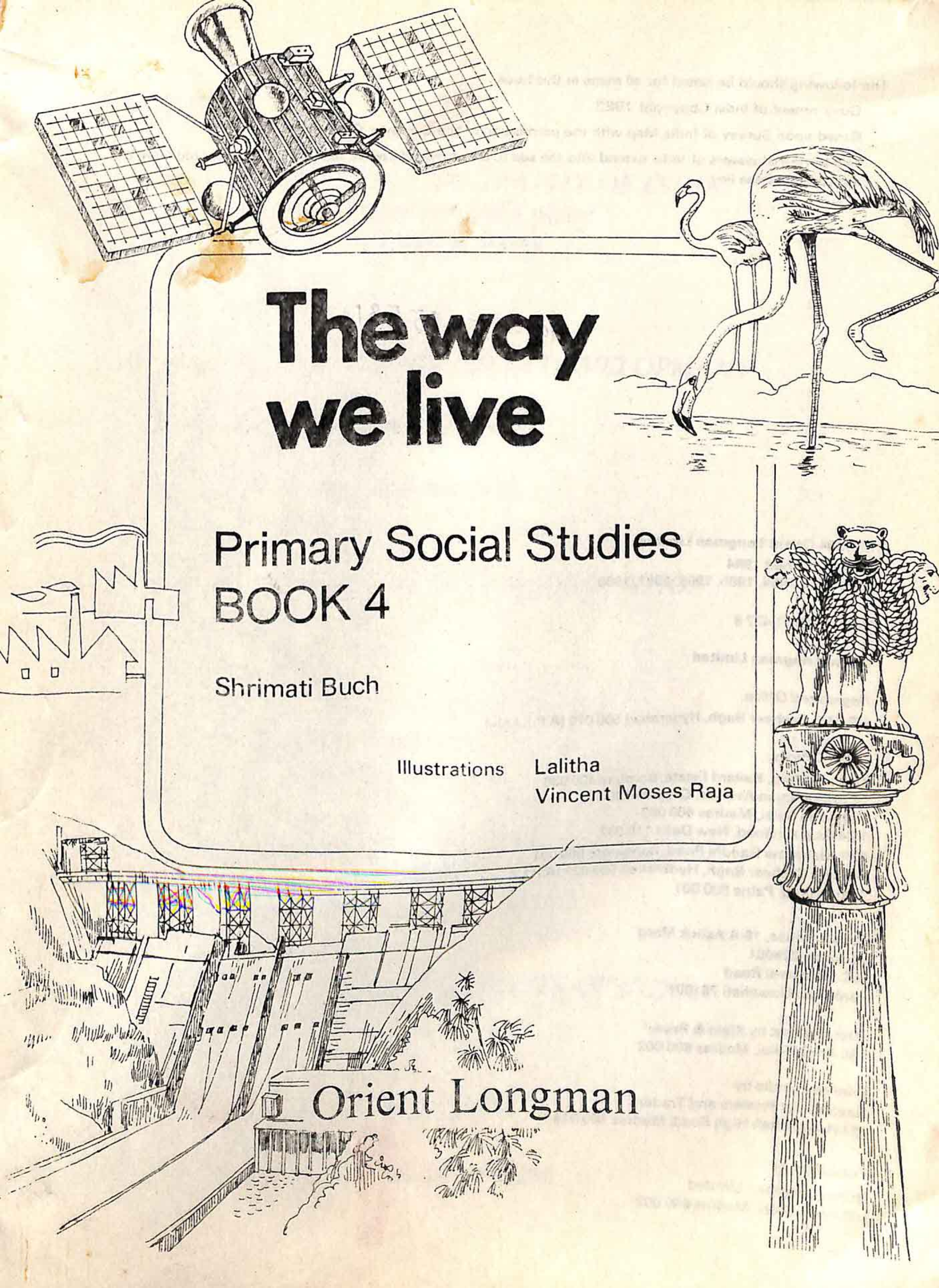


Shrimati Buch
Indira Narayanan

Orient Longman



The way we live

Primary Social Studies
BOOK 4

Shrimati Buch

Illustrations Lalitha
Vincent Moses Raja

Orient Longman

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

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TO THE TEACHER

The Way We Live introduces the primary-school child to social studies, which means not only the subjects of history, geography and civics, but also an integrated framework for the *understanding* of nature and human society. The series closely adheres to the syllabus drawn up by the National Council of Educational Research, but is adaptable to primary-school teaching of social studies under other systems as well.

The earlier books of the series tackle the immediate surroundings of the child, her family, the neighbourhood and the school. The elements of each of these units and the need for harmony in each is emphasised. As the child's social world expands, *The Way We Live* takes her beyond the smaller world of her immediate environment to the state, the country and a national heritage. The way people live in our country is explored through lifestyles, social and economic pursuits, agriculture, industry, transport and communication, our culture, and political and social institutions. All these are introduced to the student through simple, comprehensive text and illustrations.

The Way We Live is, as its title suggests, a means of participation for the child in her environment, as she learns about it. The vital, underlying concepts are ecology, the conservation of the natural world and living as a process of continuous interaction. One of the primary aims of the series is to develop attitudes of concern and involvement in the child.

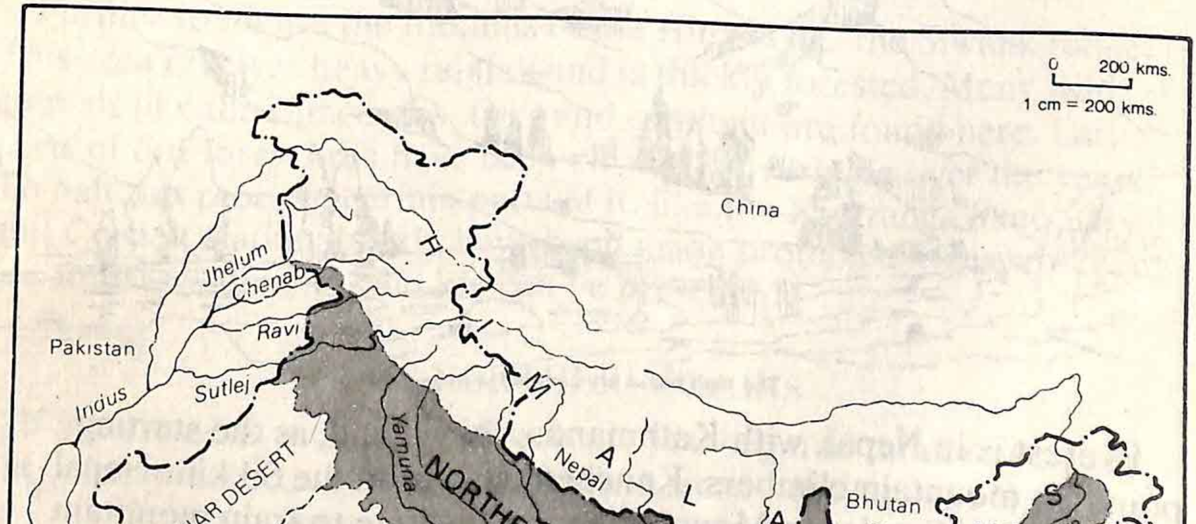
Illustrations and exercises to this end are an integral part of each lesson. Every effort has been made to make the text pleasant and the exercises an enjoyable activity. The teacher is advised to use the opportunities within and beyond the books to get the children to express themselves — in words, in writing and in activity.

UNIT I *THE PHYSICAL GEOGRAPHY OF INDIA*

1. The mountains and the northern plains

India is a large country, quite as big as China, Brazil or Canada, though not as big as the U.S.S.R. In fact India is so large and distinct that, along with Pakistan and Bangladesh, it is often called a 'subcontinent', a sort of baby continent.

Pointing southwards from Asia, India is not a symmetrical country. It is broad in the north, with plains running from west to east. Below that it becomes much narrower, until it ends in a point (cape) at Kanyakumari in the Indian Ocean. This narrow part is the Indian peninsula (=almost an island) with water on three sides and land only on one. Along the entire coastline of India is a narrow ribbon of flat land running beside the sea, called the coastal plains.



The mountains and the northern plains of India

THE MOUNTAIN RANGES

India is separated from the rest of Asia by the great Himalayan range. It is the highest and southernmost loop of a continuous chain of mountains from Turkey at the western end of Asia, upto the far north-east of the continent. In our area it has different parts: the Hindukush and Suleimans in Afghanistan and Pakistan, the Karakorams in Kashmir, the Garhwal Himalaya in Uttar Pradesh, the Nepal Himalayas, and the Eastern Himal along the north-eastern border.

High peaks and passes

Some famous peaks over 8000 m (2500 ft) high, are Nanga Parbat and K2; Annapurna and Dhaulagiri; Everest, the highest mountain in the world; Makalu and Kanchenjunga.

The high peaks are covered with snow.

Everest is in Nepal, with Kathmandu, the capital, as the starting point for mountain climbers. Kanchenjunga is on the Sikkim-Nepal border. The Himalayan Mountaineering Institute to train mountain climbers is at Darjeeling in West Bengal. Tenzing was the Director of the Institute till very recently. A little to the west of Everest is the highest Himalayan pass, the Nangpa-la, through which traders from and into Tibet come and go. There are other passes, near Sikkim and Bhutan, but the best known ones in Indian history are the Khyber pass, the Bolan pass and the Gomal pass in the west.

The Lesser Himalayas

South of the high ranges are the Lesser Himalayas. The altitude here averages 5000 m above sea level. While the high peaks to the north are covered with snow throughout the year, on the slopes of the Lesser Himalayas there are forests of pine and deodar. In this region also, we find famous hill stations like Srinagar, Simla, Mussoorie and Darjeeling. In the valleys live hill folk who grow fruit, tea and some grains on the terraced hillsides in summer. They produce woollen goods and wood carving in winter. The hill folk also graze sheep and goats on these slopes.

Sheep graze on the lower hill slopes.

The foothills

Further south are the foothills of the Himalayas, the Siwalik range. This area receives heavy rainfall and is thickly forested. Many wild animals like the rhinoceros, tiger and elephant are found here. Large parts of this forest area have been cleared for farming over the years. To halt this process, certain parts of it, like the Kaziranga Sanctuary and Corbett National Park, have been made protected areas where our forest wealth and wild life can be preserved.

THE NORTHERN PLAINS

If you travel by train or road in India you begin to think it is a very flat country indeed, with just two highland areas — the faraway Himalayas and the Western Ghats to one side. But if you fly over India or look at a map showing heights (a relief map) you find that most of India is not at all flat, it is fairly high.

The really flat areas are only two: 1. The northern plains, which make a curve between the Himalayan foothills and the Vindhyas; 2. the coastal plains. The rest of India is quite high above 'mean sea level' (MSL) from which heights on land are measured.

Rivers of the northern plains

The great northern plains are the part called in ancient times 'Bharatavarsha', from which India, today, gets its Indian name 'Bharat'. It is here, along its rivers, that early settlers made their homes and later, famous kings built their empires. It is one large plain from Punjab and the Rajasthan desert in the west to the Brahmaputra valley in the east, but because of its size we cannot help calling it 'plains'. Also, many rivers flow along it and cut it up into smaller areas, smaller plains. The mighty Ganga runs almost in the centre, joined not only by the Yamuna but, right from its upper course to its end, by several other rivers and, of course, by the Brahmaputra. Below the junction (confluence) with the Brahmaputra is the great industrial city and port of Calcutta, where the river is known as the Hooghly, before it joins the sea.

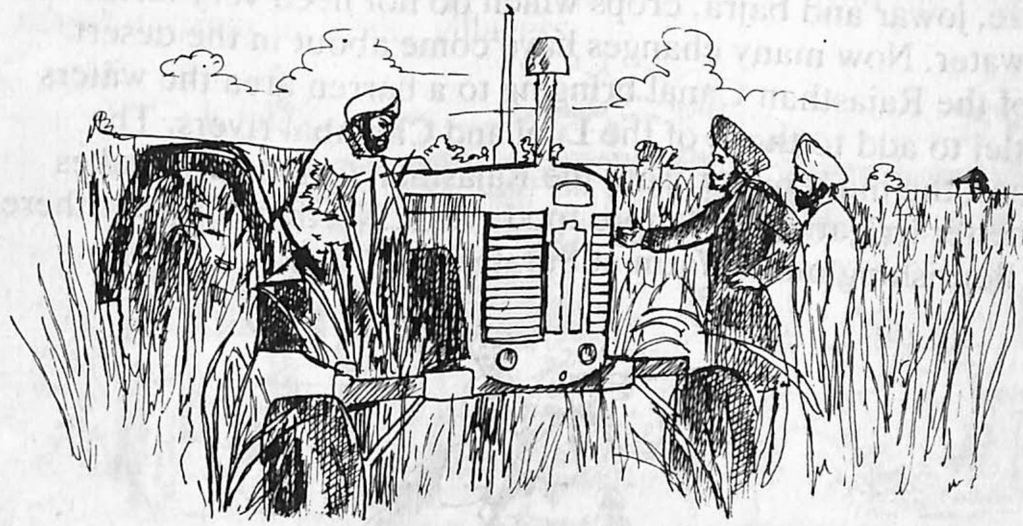
To the north-west of the Ganga basin the plains cover the states of Punjab and Haryana. In this area flow the Beas and Sutlej which join the Indus in Pakistan. Further south, below the Rajasthan desert, lies the plain of Gujarat. East of the Ganga basin a narrow arm of the northern plains stretches into the hills of the north-east. This is the Brahmaputra valley.

Farming and industry

The very fertile northern plains are both a farming and an industrial region because they have plenty of water and, in the east, in Bihar and Bengal, many kinds of minerals. The water also serves to produce electricity as at Bhakra Nangal on the Sutlej in Punjab and at Tilaiya in the Damodar valley in Bihar.

Wheat is the major crop of the area though West Bengal produces rice and now even Punjab is growing enough rice to send to southern markets. In addition to big and small rivers, the whole area is criss-crossed with many canals. These rivers and canals are full even during the very hot summer, with the melting snows at the source of many of the rivers bringing an additional supply of water to the plains. The rivers have also, for centuries, spread fine silt (river mud) on the fields whenever they have flooded their banks and then withdrawn. So the northern plains can grow crops like wheat, rice, sugarcane and dal all the year round.

The main industrial cities are Kanpur, Lucknow, Varanasi in Uttar Pradesh, Patna in Bihar and, of course, Calcutta in West Bengal. In addition there are many smaller industrial towns and areas like Faridabad near Delhi. Mathura has a large oil refinery. The state of Haryana has made such good use of the water and electricity available that there are industrial areas all over the state, in addition to prosperous farms. Cattle is also reared in Haryana. Gujarat has a flourishing dairy industry.



Wheat is grown in the northern plains.

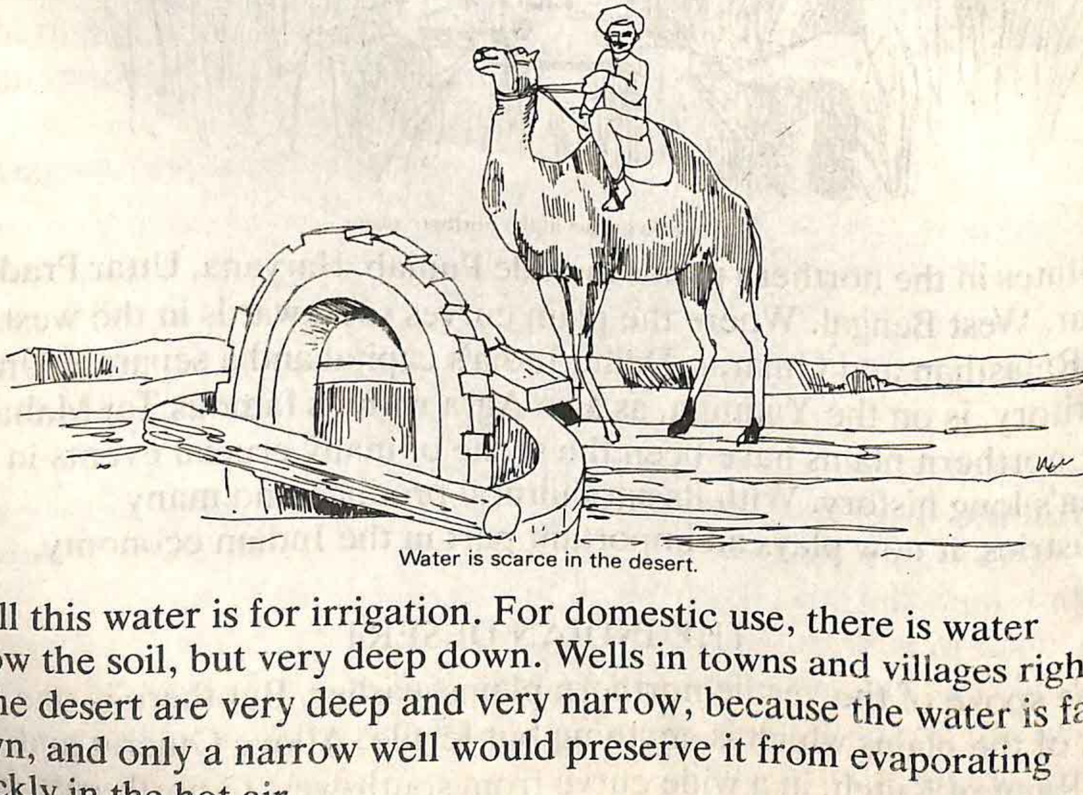
States in the northern plains include Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal. Where the plain curves southwards in the west, are Rajasthan and Gujarat. Delhi, India's capital and a separate Union Territory, is on the Yamuna, as also Agra with its famous Taj Mahal. The northern plains have been the scene of many crucial events in India's long history. With its agricultural produce and many industries, it now plays an important part in the Indian economy.

THE INDIAN DESERT

We spoke of the 'fertile northern plains' earlier. But there is one part of the plains which is anything but fertile. Above Gujarat and the Rann of Kutch, in a wide curve from south-west to north-east, is an area of desert over 500 km long and 250 km wide. This is the Thar desert, or the 'Great Indian Desert'. The Aravalli hills are to its south-east and parallel to it while the Chambal and Luni rivers flow along its edge.

Sources of water

The Indian desert has large areas of sand and silence, but wherever there is any sign of water, with thorny babul and kakhar trees bordering a few yards of grass around the water, there are little villages. The desert people have always used the damp areas around little ponds to grow maize, jowar and bajra, crops which do not need very fertile soil or much water. Now many changes have come about in the desert because of the Rajasthan Canal bringing to a barren area the waters of the Sutlej to add to those of the Luni and Chambal rivers. The Gangasahar, the main outlet from the Rajasthan Canal, also makes possible better irrigation and more food crops. North of Bikaner there is even a flourishing model farm at Suratgarh.



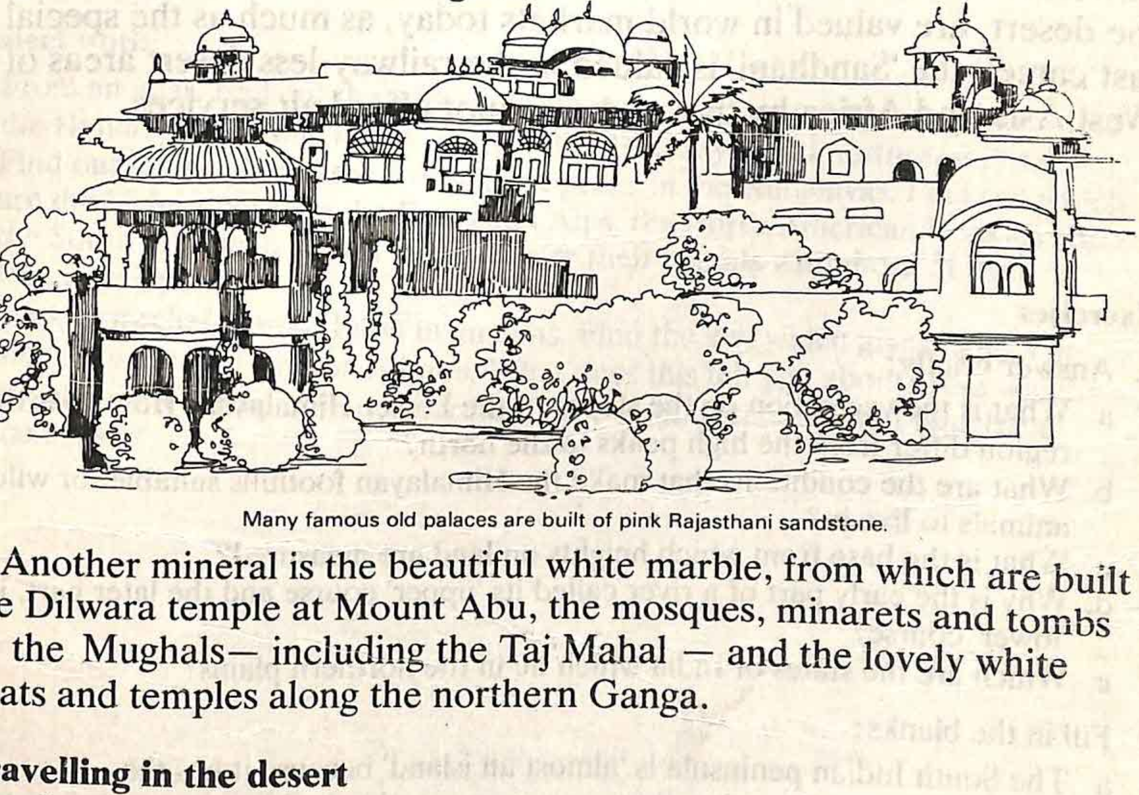
Water is scarce in the desert.

All this water is for irrigation. For domestic use, there is water below the soil, but very deep down. Wells in towns and villages right in the desert are very deep and very narrow, because the water is far down, and only a narrow well would preserve it from evaporating quickly in the hot air.

While in summer the desert is very hot, in winter it is bitterly cold. Even a summer night can become quite chill, as in all desert areas. Holi, which marks the return of spring and warmth and growth of plants, is in Rajasthan a very important festival.

A desert 'crop'

The desert has one very useful 'crop'. It is a stone crop. The beautiful pale or deep pink of Rajasthani sandstone has gone to make many famous and beautiful fortress-palaces of the old Rajput princes and many of the massive government buildings of New Delhi. It is both strong and graceful, and quarrying it (taking it from the rocks) is a major occupation of the villagers.

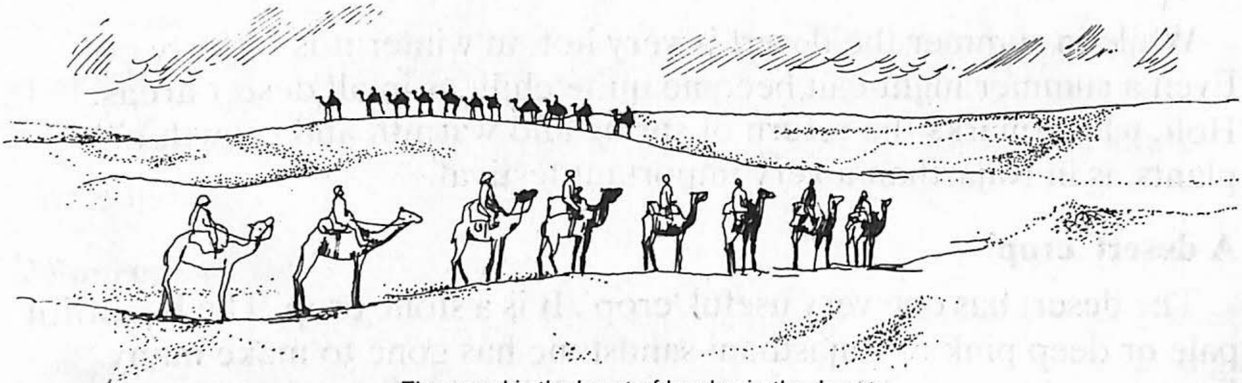


Many famous old palaces are built of pink Rajasthani sandstone.

Another mineral is the beautiful white marble, from which are built the Dilwara temple at Mount Abu, the mosques, minarets and tombs of the Mughals– including the Taj Mahal – and the lovely white ghats and temples along the northern Ganga.

Travelling in the desert

So even in very difficult conditions the hardy Rajasthani people have managed to grow crops, build palaces and develop artistic skills. To move from place to place there are a few railway lines, connecting the desert towns to Delhi and Ahmedabad and from there to other parts of India. But large areas have no rail or road, and most of the desert still uses its ancient 'camel trains'. The camel is the beast of



The camel is the beast of burden in the desert.

burden for whole families, carrying them and their goods from one little patch of water to another. In the old days, the princes rode on powerful fast horses, and the horses of Kutch, on the southern edge of the desert, are valued in world markets today, as much as the special fast camel, the 'Sandhani' is valued in the railway-less desert areas of West Asia and Africa by those who cannot afford air services.

Exercises

1. Answer briefly:
   a. What is the vegetation on the slopes of the Lesser Himalayas? How does this region differ from the high peaks to the north?
   b. What are the conditions that make the Himalayan foothills suitable for wild animals to live in?
   c. What is the base from which heights on land are measured?
   d. Why is the early part of a river called its 'upper' course and the later part, its 'lower' course?
   e. Which are the states of India which lie in the northern plains?

2. Fill in the blanks:
   a. The South Indian peninsula is "almost an island' because it has the __________ of Bengal to the __________, the Arabian __________ to the __________ and the __________ Ocean to the south. But to the __________ lie the Vindhya __________.
   b. The river that gives life to the northern plains is the __________. Its chief tributaries are the __________ and the __________. It is also joined by other rivers like the __________, __________ and the __________. Near Calcutta, it is called the __________.

3. Match columns A and B:

A	B
Kashmir	Garhwal Himalayas
Assam	Karakoram
Uttar Pradesh	Hindukush
Afghanistan	Eastern Himal

4. In the northern plains, name:
   a. Two states
   b. Two holy cities
   c. Two state capitals
   d. Two industrial cities
   e. A major port

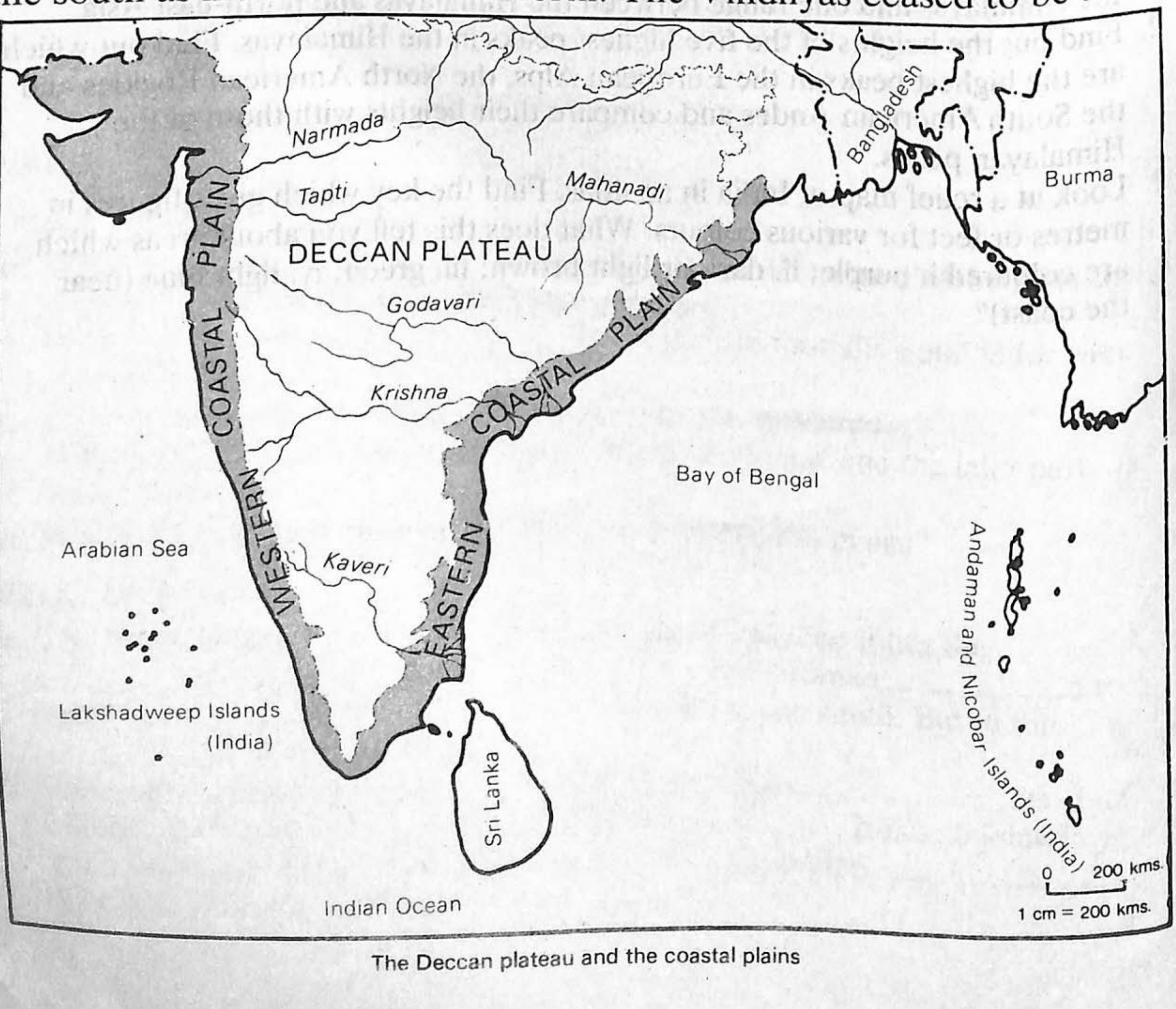
Project work

1. From an atlas, find out the names of one mountain range between Turkey and the Himalayas and one range between the Himalayas and north-east Asia.
2. Find out the heights of the five highest peaks in the Himalayas. Find out which are the highest peaks in the European Alps, the North American Rockies and the South American Andes and compare their heights with those of the Himalayan peaks.
3. Look at a relief map of India in an atlas. Find the key which gives figures in metres or feet for various colours. What does this tell you about areas which are coloured i. purple; ii. dark or light brown; iii. green; iv. light blue (near the coast)?

2. The plateau and the coastal plains

THE DECCAN PLATEAU

The Deccan plateau begins with the Vindhya mountains and the Satpura and Mahadeo hills of Central India. In former times they were a troublesome barrier to soldiers, traders or other travellers and kept north and south apart. Even so the emperors Asoka, Samudragupta, Harsha and Aurangzeb did send their armies into the south and from the south the Chola king Rajendra sent an army all the way to the Ganga. But none of them found it easy to maintain rule across the Vindhyas and very soon north and south lived their separate lives again. This mountain barrier is one reason why Muslim culture did not influence the south as much as it did the north. The Vindhyas ceased to be a



The Deccan plateau and the coastal plains barrier only when the British built railways and roads across the whole country. Today, aeroplanes fly daily across India in a couple of hours.

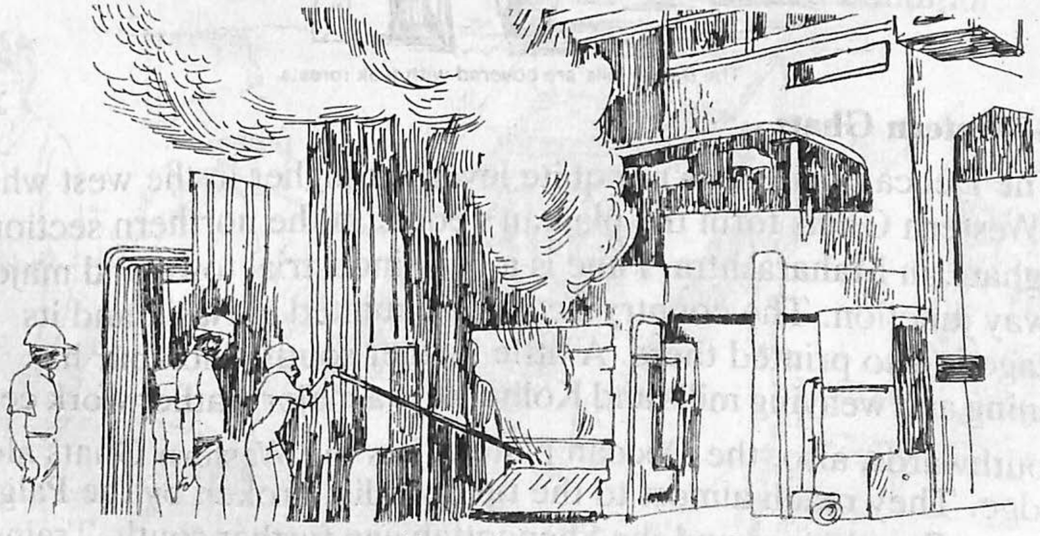
The Vindhyas and Satpuras

The part of India one can call 'fairly high' is the region of the Vindhyas and Satpuras. These hills are not high enough for snow but have thick open forests and bush with a variety of small animals living in their many valleys. In that Central Indian area there are cool hill stations like Pachmarhi and the national park of Kunwaha.

From the Vindhya, Satpura and Mahadeo ranges the rivers Narmada and Tapi (Tapti) flow to the Arabian Sea. Northwards, the plateau slopes to the plains with ancient Ujjain and Malwa on the Malwa plateau and Gwalior at its edge. The major railway junctions of Itarsi and Bina are in this area. At these junctions, trains running between Delhi and Madras meet those running between Bombay and Calcutta as at a crossroads. Nagpur to the south of this Central Indian region is a large town, a centre for cotton mills and fruit farms.

The north-east of the plateau

The north-east of the Deccan plateau falls into the three natural divisions of Chota-Nagpur, Chattisgarh and the Bastar hills. The Chota-Nagpur area, in Madhya Pradesh and Bihar, has valuable minerals like coal, iron and mica. Jamshedpur, India's largest industrial

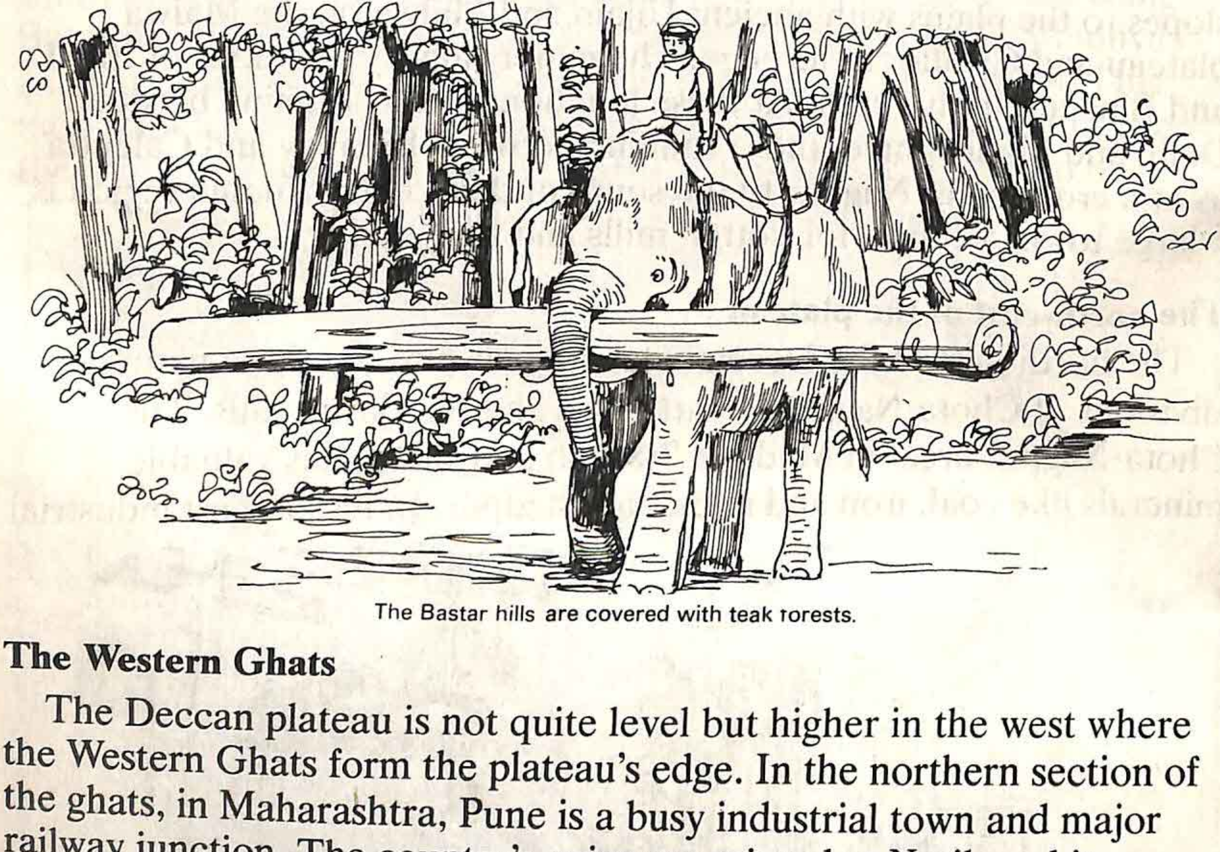


A steel factory in Jamshedpur

town, is in this area, as also Rourkela and Bokaro. Ranchi and Dhanbad are well known coal mining towns. Much of the rest of this area is covered with forests where tribal people live.

The Chattisgarh plain in Madhya Pradesh and Orissa is well-settled with the Mahanadi flowing through it. Rice is grown here with the help of India's first big peninsular dam at Hirakud. Bhilai, the steel town, is in this area.

South of Chattisgarh are the Bastar hills, also forest covered, with valuable natural teak and sal plantations. Logs of both these woods fetch high prices in Indian and world markets and the leaves are used locally for thatching, fuel and fodder.

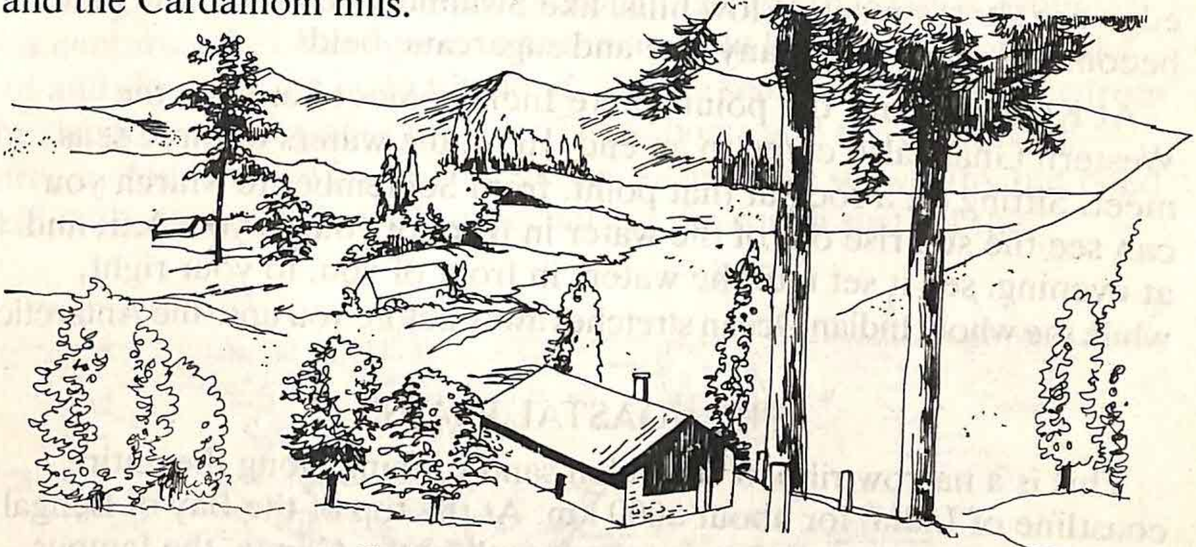


The Bastar hills are covered with teak forests.

The Western Ghats

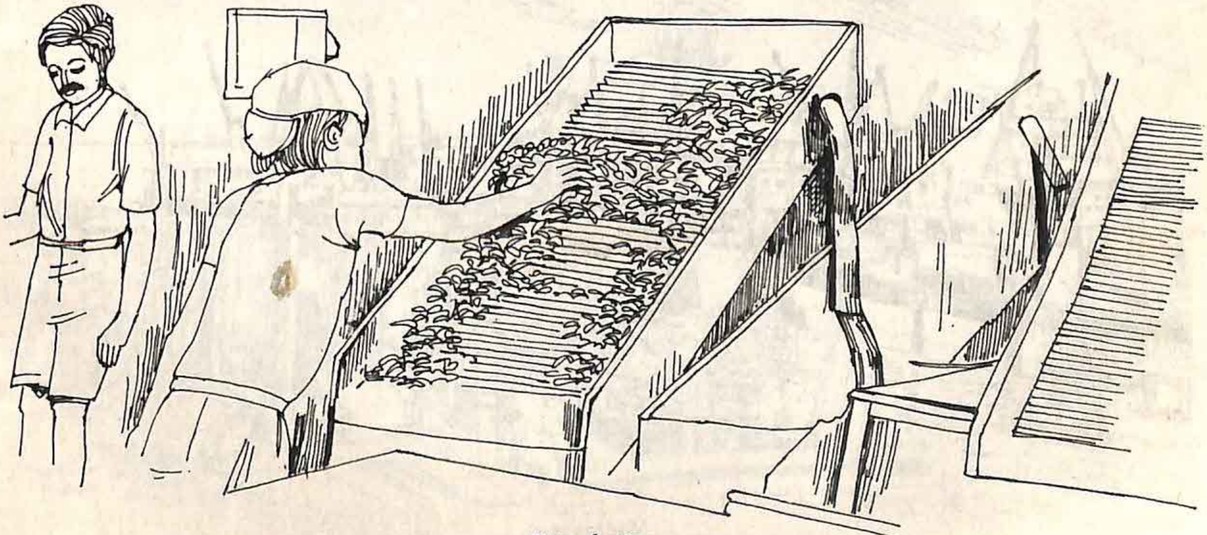
The Deccan plateau is not quite level but higher in the west where the Western Ghats form the plateau's edge. In the northern section of the ghats, in Maharashtra, Pune is a busy industrial town and major railway junction. The country's coins are minted at Nasik and its postage is also printed there. A little further south, Sholapur has spinning and weaving mills and Kolhapur is a major leather work centre.

Southwards, also, the Deccan plateau has the Western Ghats along its edge. They reach almost to the tip of India, broken by the Palghat gap near Coimbatore and the Shencottah gap further south. Trains and highways cross into Kerala, on the west coast, through these two breaks. Other roads are also built, winding up to hill towns on one side and snaking down to the coastal plains on the other. The highest peak of the Western Ghats, Anaimudi (over 2500 m) lies between the Anaimalai and the Cardamom hills.



The hill station of Ooty is in the Nilgiri range.

A little to the east, on a spur of the ghats, is the hill station of Kodaikanal. Udhagamandalam (Ooty), the foremost hill station of South India, is in the Nilgiri range near Coimbatore. Here also are the tea-factory towns of Coonoor and Kotagiri with Gudalur on the western side, near the wild life sanctuaries of Mudumalai and Bandipur.



A tea factory

The eastern ranges

From the heights of the Western Ghats, the plateau slopes gradually to the east, with many smaller hill ranges here and there, like the Shevaroy, Javadi, Chamundi and the Tirumalai hills. On its eastern edge are short ranges of low hills, like Swamimalai, before the plateau becomes a plain with many rice and sugarcane fields.

At Kanyakumari, the point where India comes to an end, the Western Ghats also come to an end. Here, the waters of three seas meet. Sitting on a rock at that point, from September to March you can see the sun rise out of the water in front of you, to your left, and at evening, see it set into the waters in front of you, to your right, while the whole Indian Ocean stretches away before you upto the Antarctic.

THE COASTAL PLAINS

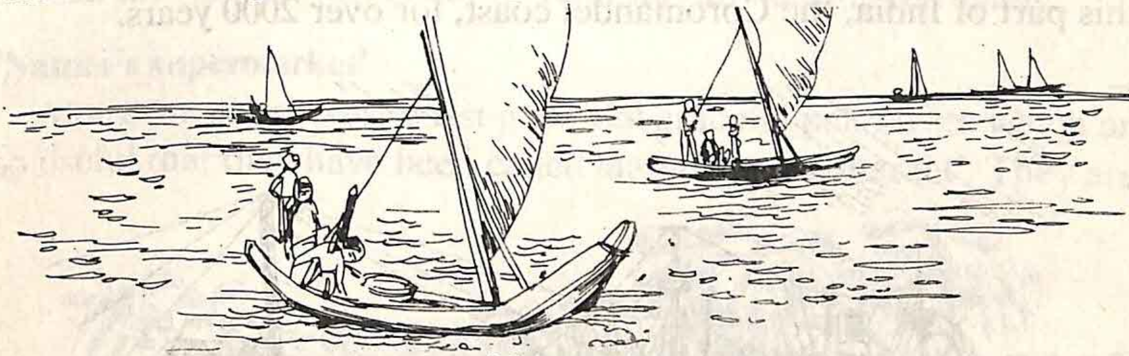
This is a narrow ribbon of golden sand running along the entire coastline of India, for about 5000 km. At the top of the Bay of Bengal the plain is broad and contains the mouth of the Ganga, the famous Sunderbans, home of the Royal Bengal Tiger. Along India's eastern coast this coastal strip is quite broad and houses cities like Bhubaneshwar and Puri, seaports like Paradeep, Vishakhapatnam, Madras and Tuticorin and river mouths like those of the Mahanadi, Krishna, Godavari, and the Kaveri. All along its inner margin are villages and

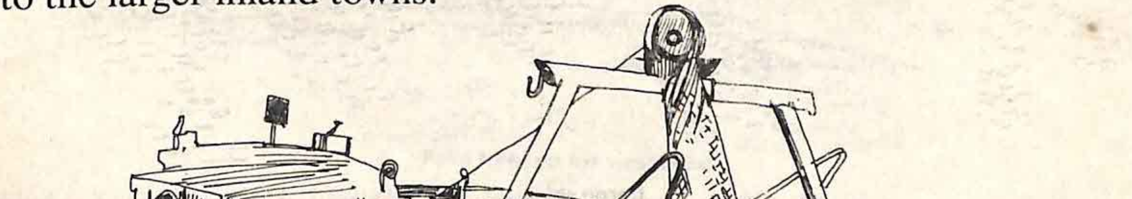
Madras port

towns, fields, factories, and harbours made by man ('artificial harbours') for ships plying in and across the Bay.

Fishing

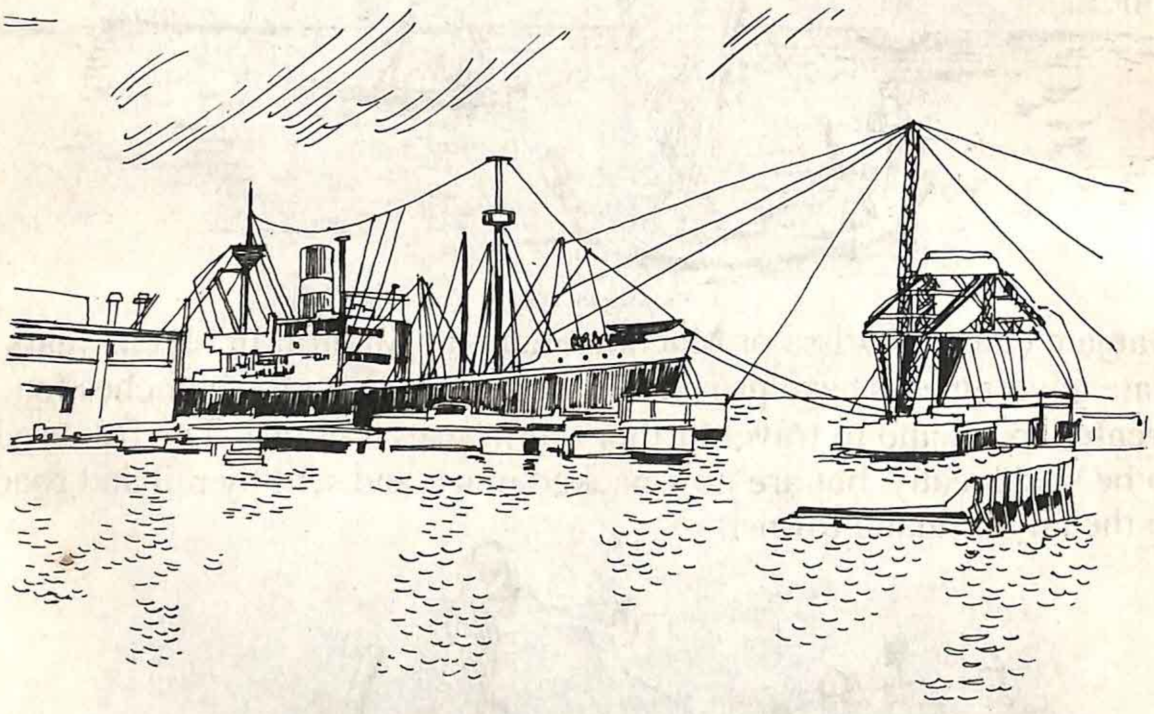
A major occupation of villagers along the eastern coast is fishing. For centuries they have gone to sea in 'masula boats' made of planks cut and shaped from coconut wood, to take seasonal fish catches from the deeper waters across the surf. These boats and the catamaran – three or four shaped logs tied together – are very seaworthy but need skill and courage to handle, especially in the rough surf off the Ganjam coast of Orissa or Machilipatnam in Andhra. In recent years state governments have provided fishermen with motor launches for greater speed and to travel further out in search of fish. The fish used to be sold locally, but are now packed in ice and sent by rail and road to the larger inland towns.


Catamarans at sea


Fishermen now have motor launches.

Overseas trade

Inland from the coast, rice is grown in Andhra and Tamil Nadu and tobacco in Andhra. Guntur in Andhra, a leading tobacco-collecting town, will soon be one of the country's container transport centres, sending crates to cargo ships at Madras. Madras itself is a collecting and shipping centre for hides and skins, leather products, tea and coffee. It has India's first complete container wharf, to load cargo neatly and easily in large metal boxes on specially built ships coming from many parts of the world. Fishing and overseas trade have flourished in this part of India, the Coromandel coast, for over 2000 years.



Cargo ships

The western coast

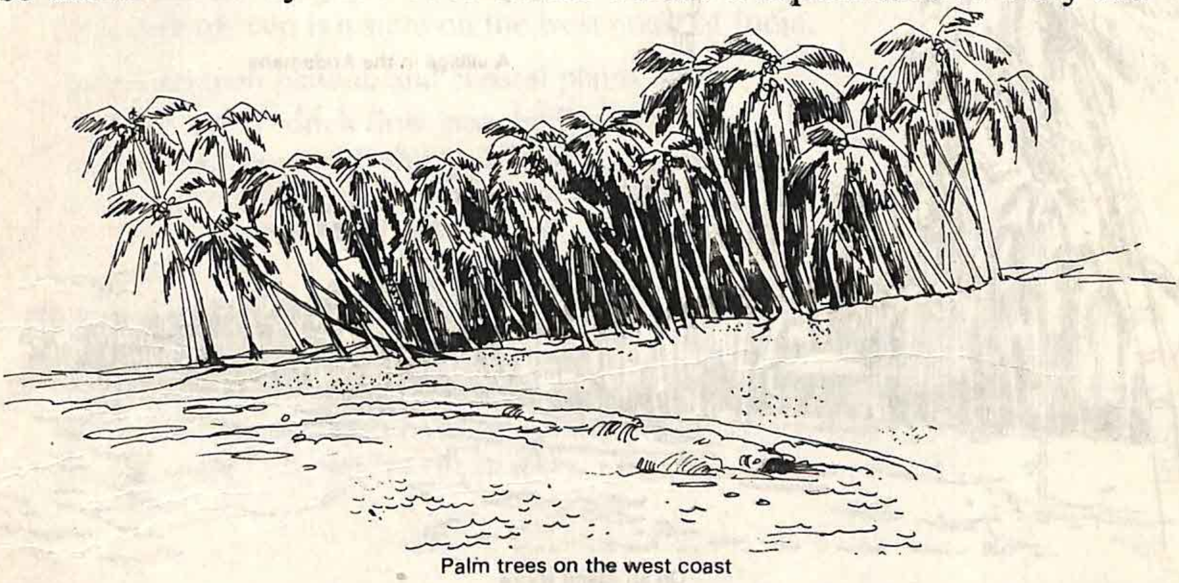
On India's western coast the plain is too narrow for many fields because the Western Ghats rise like a great wall behind it. But within the curve of these hills there are many small bays and inlets where rivers come to the sea. There are many small natural harbours on the Konkan coast, some artificial ones like Mangalore and Mormugao and really large natural ports like Bombay and Cochin. Bombay is an island behind which ships can safely shelter. It is India's busiest port, with miles of wharfs and road and rail and air links with the entire country.

The Gujarat coast also has natural harbours — Jamnagar, Kandla, Porbandar — all of which take quite large ships trading both between Indian ports and with ports far away.

From early times, ports in Kutch, Saurashtra and on the Gulf of Khambhat have traded across the Arabian Sea with Africa and with Persian and Arab ports. Surat, on the Tapti, was a famous port (the British first landed there) till the river mouth became too sandy.

'Nature's supermarket'

Along the entire west coast grow tall graceful palm trees which are so useful that they have been called 'nature's supermarket'. They are particularly plentiful in the southern part, on the Malabar coast, which also grows and exports cashew and pepper. It was for pepper that Vasco da Gama came, in 1498, to the port of Calicut, changing the course of world history. Cochin is, like Bombay, a natural harbour, with a deep sheltered lagoon running along the coast. It is not only a port, but a shipbuilding centre, and has naval training and dockyard establishments on Wellington Island.

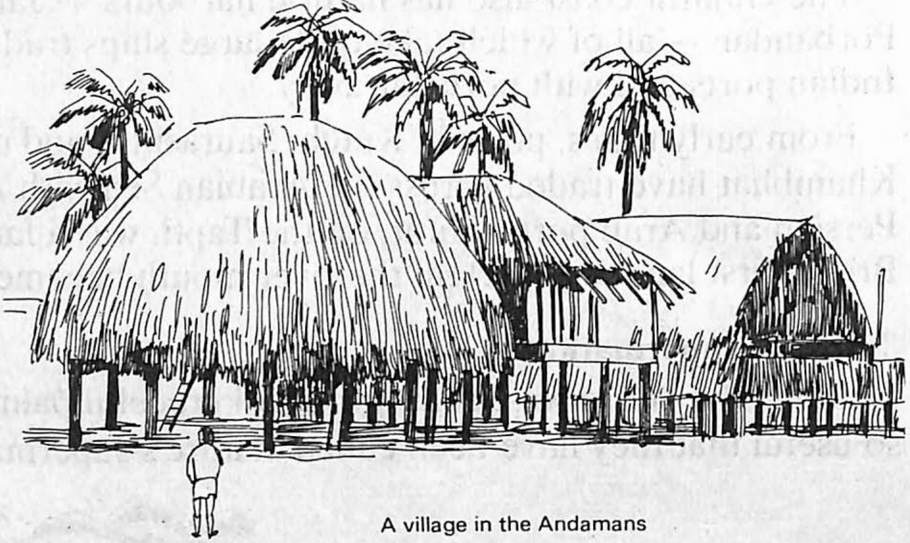


Palm trees on the west coast

Fishing is also an important occupation along the west coast.

ISLAND TERRITORIES

The Andaman and Nicobar Islands in the Bay of Bengal and the Lakshadweep Islands in the Arabian Sea are also part of India.



A village in the Andamans

On an island shore

Exercises

1. Answer briefly:
   a. Which sea do the Narmada and the Tapti flow into?
   b. What are the three natural divisions of the north-east of the Deccan plateau?
   c. Which is India's largest natural harbour? Is it on the west coast or the east?

d. Why are there many more small natural harbours on the west coast than on the east?

e. What is known as 'nature's supermarket'? Where is it found?

2. Fill in the blanks:

a. The Vindhyas and ____________ are not high enough for ____________ but have thick ____________ and bush with many small ____________ living in their ____________. The national park of ____________ is in this area.

b. A major occupation of villagers along the coast is ____________. Nowadays ____________ governments have provided fishermen with ____________. The fish are sold ____________ or packed in ____________ and sent to ____________.

3. Correct the following statements:

a. The Deccan is a completely flat region.

b. The Western Ghats are short low hills which do not form a continuous range.

c. The Palghat gap provides a passage between North and South India.

d. Lakshadweep is a state on the west coast of India.

4. In the Deccan plateau and coastal plains name:

a. Four rivers which flow into the Bay of Bengal.

b. Two harbours with shipbuilding yards.

c. Two products grown on the Malabar coast for export.

d. The highest peak of the Western Ghats.

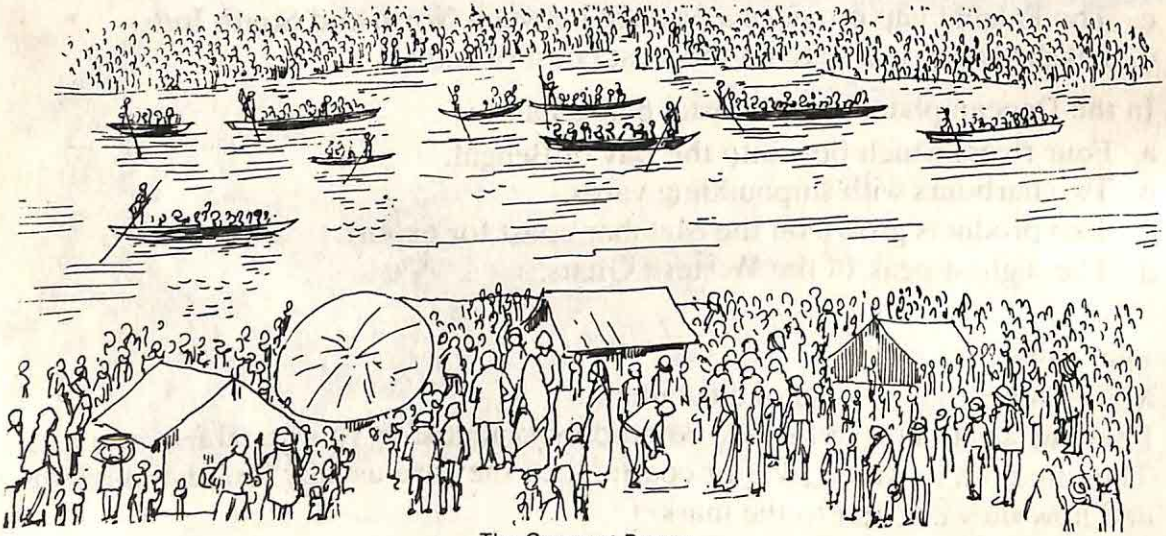
Project work

1. Make a classroom model of a catamaran.
2. Find out what kinds of fish are commonly available in your local fish market. Then find out in which river or coastal area they are usually found and caught and how they are sent to the market.

3. Rivers of India

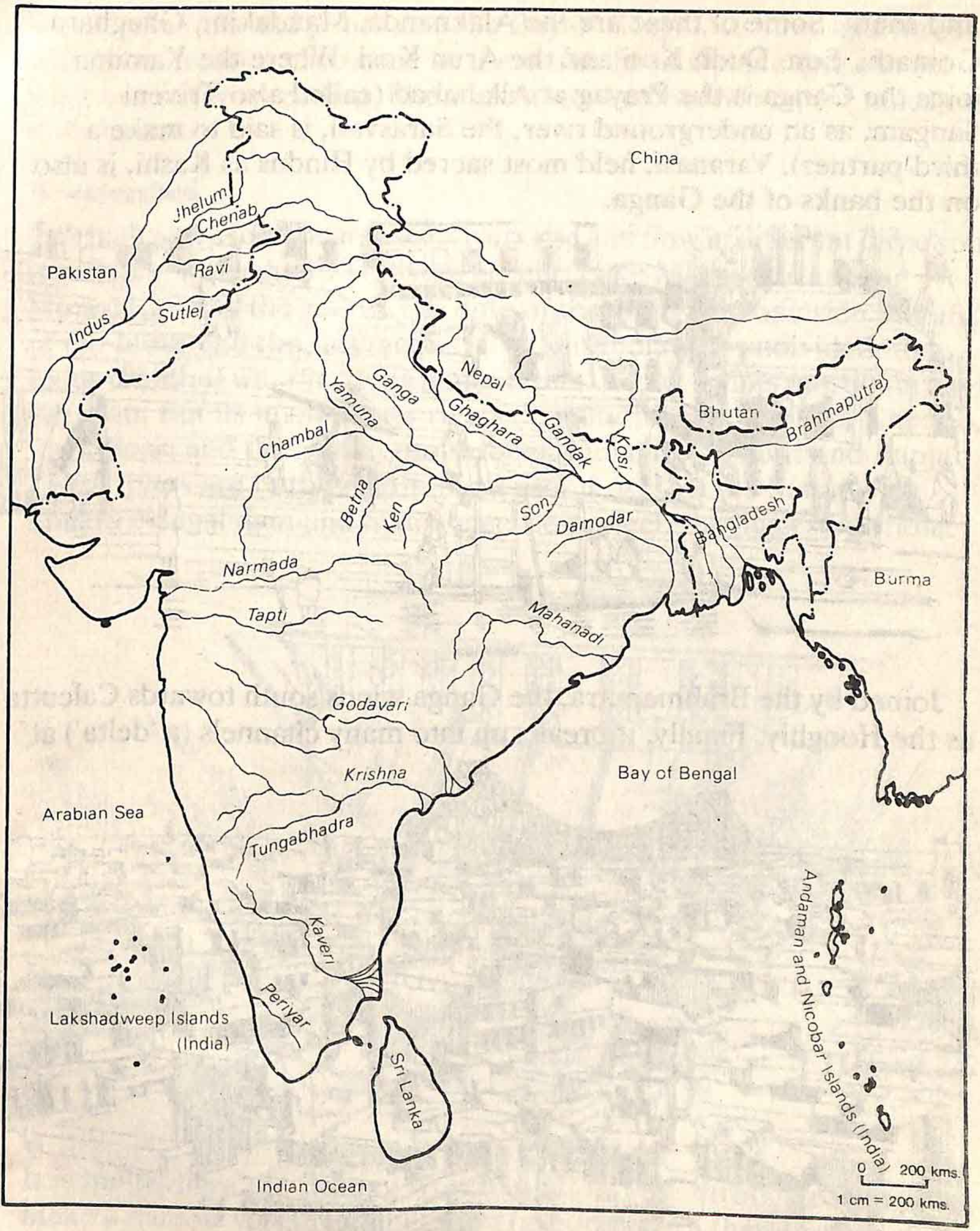
FROM THE HIMALAYAS

The major river flowing down the northern plain, clearly visible in satellite pictures taken from above the earth, is India's best known, most important ancient sacred stream, the Ganga. Many stories are told about this great, broad, fast-flowing river, and many white marble temples stand along its banks. Seeing the Ganga is very satisfying, both for its beauty and for its ancient history and traditions. Many Hindus hope to travel to its holy cities — Allahabad (Prayag, where the Yamuna joins it) and Varanasi — atleast once in their lives. When there were no trains or planes old men and women walked there to dip themselves atleast once in its sacred waters before their lives ended. At Rishikesh is the famous ashram of Sivananda Sarasvati, and a bath in summer at Haridwar (Shiva's gate) when the snow-chilled waters come rushing down, is quite unforgettable.


The Ganga at Prayag

The course of the Ganga

The Ganga rises in the Himalayas near Lake Manasarovar. It enters India in northern Uttar Pradesh and begins to flow as a small stream at Gangotri. It runs through the northern plains for 2491 km (over 1500 miles), joined all the way by many other streams from both north



The rivers of India

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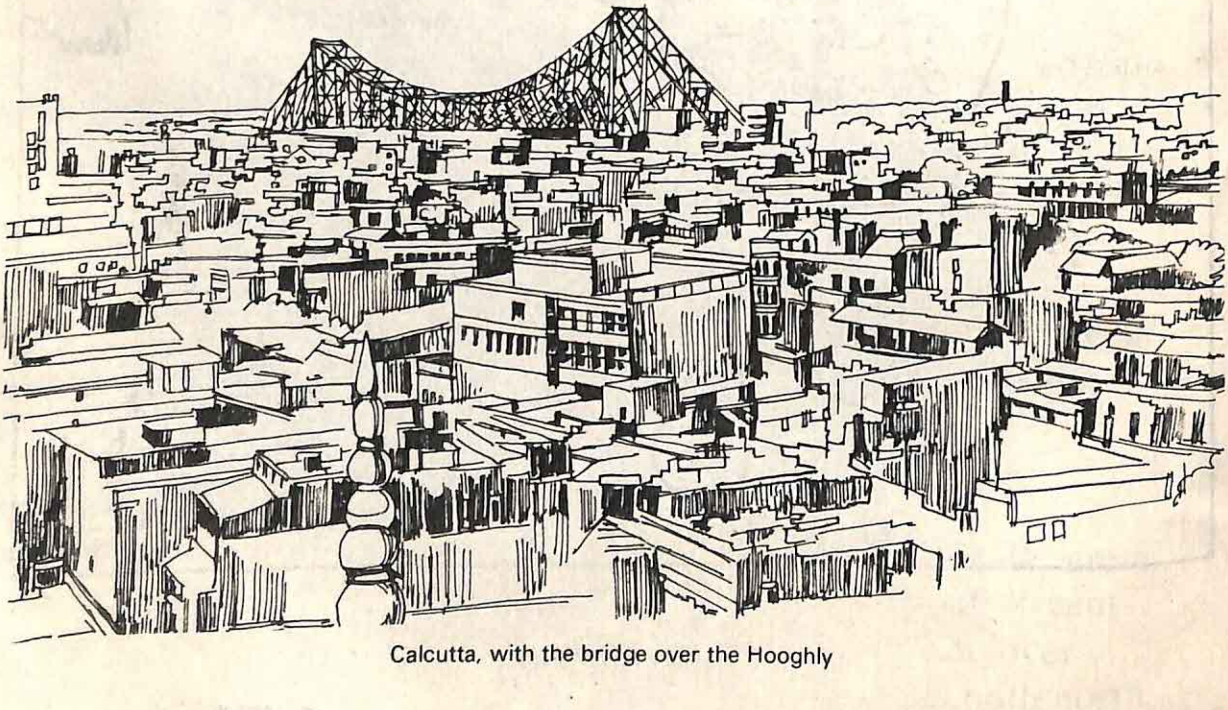
and south. Some of these are the Alaknanda, Mandakini, Ghaghara, Gomathi, Son, Dudh Kosi and the Arun Kosi. Where the Yamuna joins the Ganga is the Prayag at Allahabad (called also Triveni Sangam, as an underground river, the Sarasvati, is said to make a third partner). Varanasi, held most sacred by Hindus as Kashi, is also on the banks of the Ganga.

Varanasi

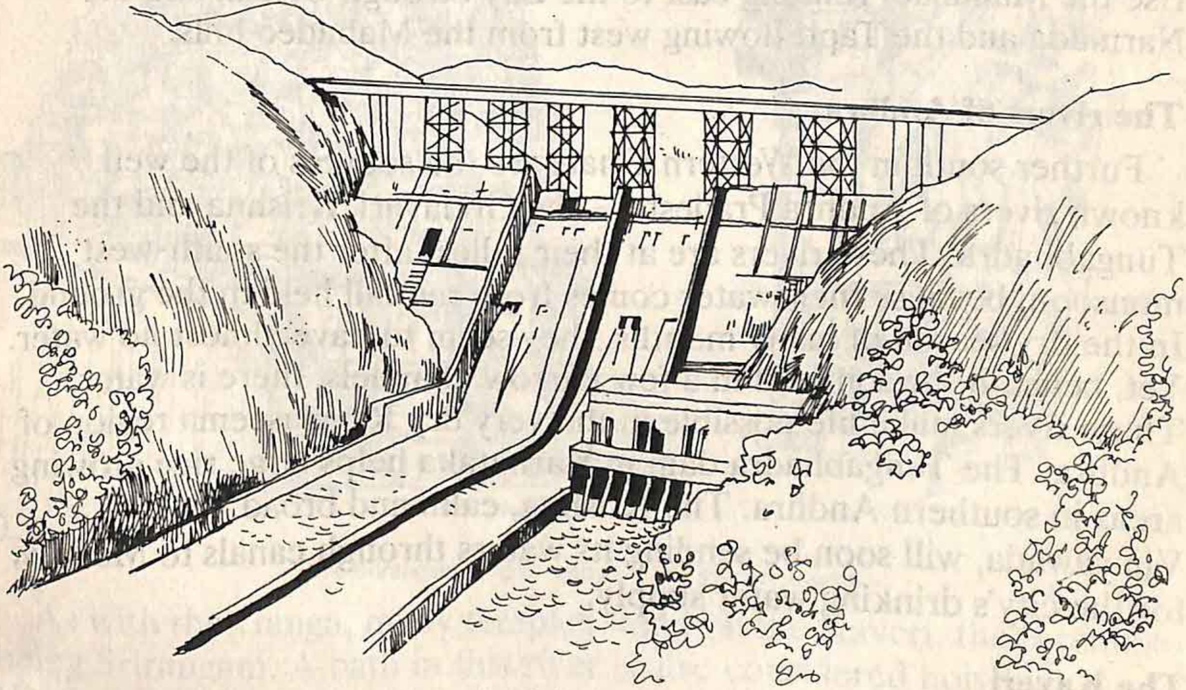
Joined by the Brahmaputra, the Ganga winds south towards Calcutta as the Hooghly. Finally, it breaks up into many channels (a 'delta') at



Calcutta, with the bridge over the Hooghly the Sundarbans and pours into the Bay of Bengal. Its flow and force over the centuries have been so great that from a plane one can see the river water spreading, like a great sand coloured fan, for miles out into the sea.

A watershed

A high place from near which rivers rise and flow in different directions is called a 'watershed'. The area around Lake Manasarovar near Mount Kailas is the source not only of the Ganga on one side but also of the Indus and the Brahmaputra. When India was undivided, the Indus (Sindhu) was one of its major rivers. Today it runs mostly through Pakistan. But its main feeder rivers ('tributaries') the Jhelum, Chenab, Ravi, Beas, and the Sutlej, run through India, in Kashmir and Punjab. These rivers are both beautiful and useful. Across the Sutlej is the Bhakra Nangal dam and hydro-electric project, the biggest in India.



The Bhakra Nangal dam

It is built where the rushing river has cut its way through rock to make a narrow valley with tall sides (a 'gorge'). All these rivers together help to make Punjab a very fertile state growing wheat for use all over India.

The Brahmaputra

The Brahmaputra begins life as the Tsang-po. It flows eastwards on the other side of the Himalayas, through Tibet, seeking a way to the sea. Entering India in the north-east, it makes its way through Arunachal Pradesh, Assam (where it is known as the Brahmaputra) and Bangladesh to become part of the Ganga. The Brahmaputra and its forceful tributary the Tista are often in the news because of the floods their plentiful waters create. The waters of the Ganga are held in a dam at Farraka, to be shared when needed, by India and Bangladesh.

FROM THE PLATEAU

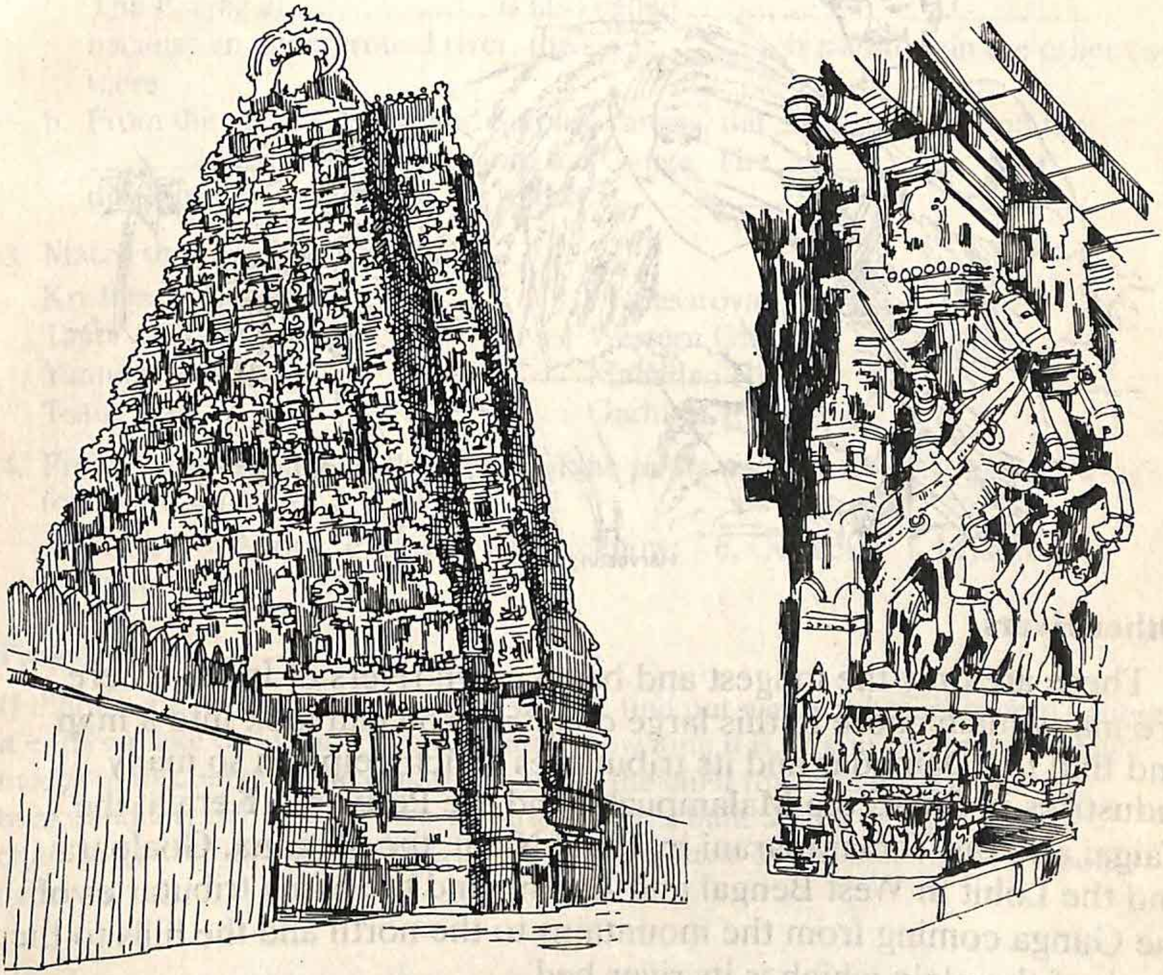
The Vindhya and Satpura ranges, running across the top of the Deccan, are also a watershed. From its northern part the Chambal and the Son flow into the northern plains to join the Ganga. Here also rise the Mahanadi running east to the Bay through Orissa, and the Narmada and the Tapti flowing west from the Mahadeo hills.

The rivers of Andhra

Further south in the Western Ghats are the sources of the well known rivers of Andhra Pradesh – the Godavari, Krishna and the Tungabhadra. These rivers are at their fullest after the south-west monsoon, because their water comes from rainfall held in the ground. In the dry season of many months, they seem to have almost no water. Yet, beneath the soil, and in a few narrow channels, there is water. These rivers make life possible in the very dry Rayalaseema region of Andhra. The Tungabhadra dam in Karnataka helps large rice growing areas in southern Andhra. The Krishna, calm and broad near Vijayawada, will soon be sending its waters through canals to Madras, for the city's drinking water supply.

The Kaveri

The most important southern river, equal in tradition and value to the Ganga, is the Kaveri. It begins in the Coorg region of the Western Ghats (in Karnataka) as a permanent small pool called the Talaikaveri (the 'head waters' of the Kaveri). It comes down in small steps till it reaches the edge of the ghats. Then it takes a plunge downwards, at Sivasamudram, where the great falls draw visitors from all over India. It runs through Karnataka and Tamil Nadu, being joined on the way by rivers like the Kabini and the Bhavani. Passing Tiruchi it slows down to break up into a delta and join the Bay of Bengal.



The Srirangam temple: gopuram and detail of carving

As with the Ganga, many temples stand on the Kaveri, the foremost being Srirangam. A bath in this river is also considered holy by Hindus and when it is full, it is a lovely sight to see its merry waters running beside many villages, held in by carefully built banks, all the way between the towns of Bhavani and Tiruchi.

Unfortunately, unlike the Ganga which receives most of its water from the melting snows in summer, the Kaveri is driest in the hot season. To store its waters for use in the dry season there are the Krishnaraja Sagar dam and reservoir in Karnataka, and the Mettur dam in Tamil Nadu. Near Tiruchi the old Chola-built Grand Anicut is still strong, and in use, to irrigate the paddy fields there.

Harvesting paddy

Other rivers

These are only the longest and best known rivers of India. There are many many more in this large country. You can look into a map and find the Damodar and its tributaries which help run so many industries in Bihar, the Malampuzha and the Periyar in Kerala, the Vaigai and the Tamaraparani in Tamil Nadu, the Meghna, Goalpara and the Lohit in West Bengal and Assam, and the many tributaries of the Ganga coming from the mountains to the north and the hills to the south of the plain which is its river bed.

Exercises

1. Answer briefly:
   a. What are the ways in which the Ganga and the Kaveri are i. alike; ii. unlike?
   b. What is a watershed? Give two examples.

c. Which is the oldest dam still in use in India?

d. Name the three important rivers of Andhra Pradesh. Which of them irrigates the southern regions of the state?

2. Fill in the blanks:

a. The ____________ rises in the Himalayas near Lake ____________. It is joined by the Yamuna at ____________ and by the ____________ in Bangladesh. The Prayag at ____________ is also called ____________ ____________ because an underground river, the ____________ is said to join the other two there.

b. From the ____________ and Satpura ranges, the ____________ and the ____________ flow north to join the Ganga. The ____________ and the Tapti flow ____________ to the ____________ Sea.

3. Match the river with its source:

Krishna	Manasarovar
Tapti	Western Ghats
Yamuna	Mahadeo Hills
Tsang-po	Garhwal Himalayas

4. From the atlas, find out the names of the rivers on whose banks the following towns are situated:

a. Delhi; b. Agra; c. Nasik; d. Lucknow; e. Cuttack; f. Mysore; g. Madurai.

Project work

If there is a river near your town or village, find out where it has its source, where it enters a lake or sea and approximately how long it is. If you can make a clay model of its course in the classroom, mark the chief towns and villages on its banks and any dams and hydro-electric projects built across the river. Make a chart to go with the clay model, giving as many facts as you can discover about the river.

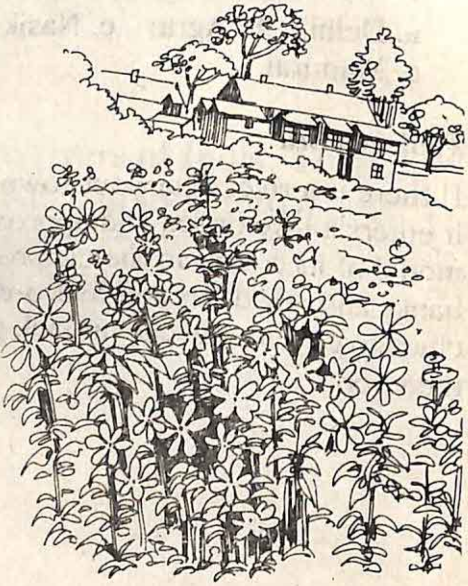
4. The climate of India

In a country as large as ours, the climate cannot be the same everywhere. In winter, places further south, nearer the equator, will be warmer than places further north, at a distance from the equator; places nearer the sea will be cooler in summer and warmer in winter than those further inland; plains will generally be warmer than the hills, in any season.

In the northern plains

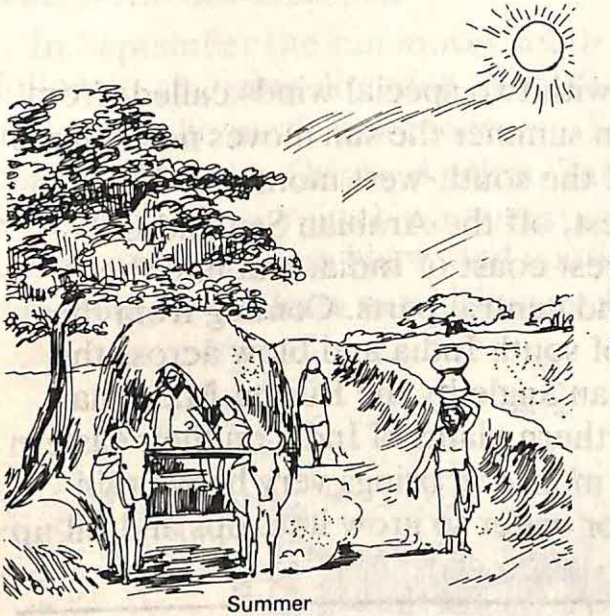
Nor does the whole country really have a winter. The northern plains, north-west India, and Central India are far from the sea and really have separate seasons. They are very cold in winter (December, January and February) with only bare leafless branches on the trees.

Winter

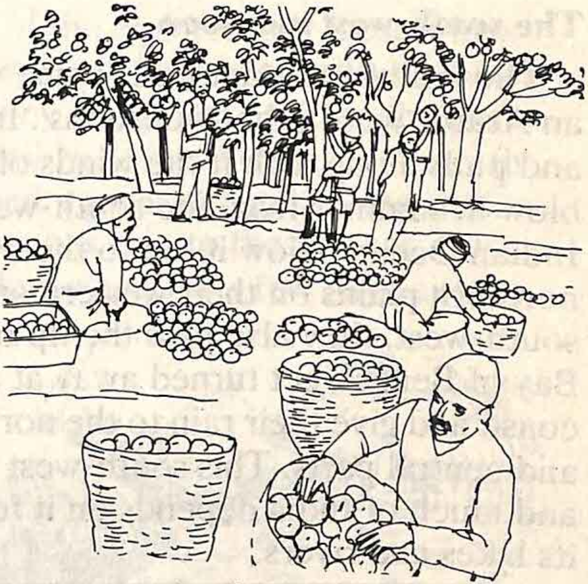


Spring

In March-April they have a real spring, with tiny little buds of green suddenly appearing everywhere. Summer (May, June, July, August) is very hot even though the trees are full of leaves and flowers. Fruits ripen and then comes autumn, as the fruits are gathered and the leaves fall. Once again comes winter, leaving only bare branches stretching darkly against the sky.



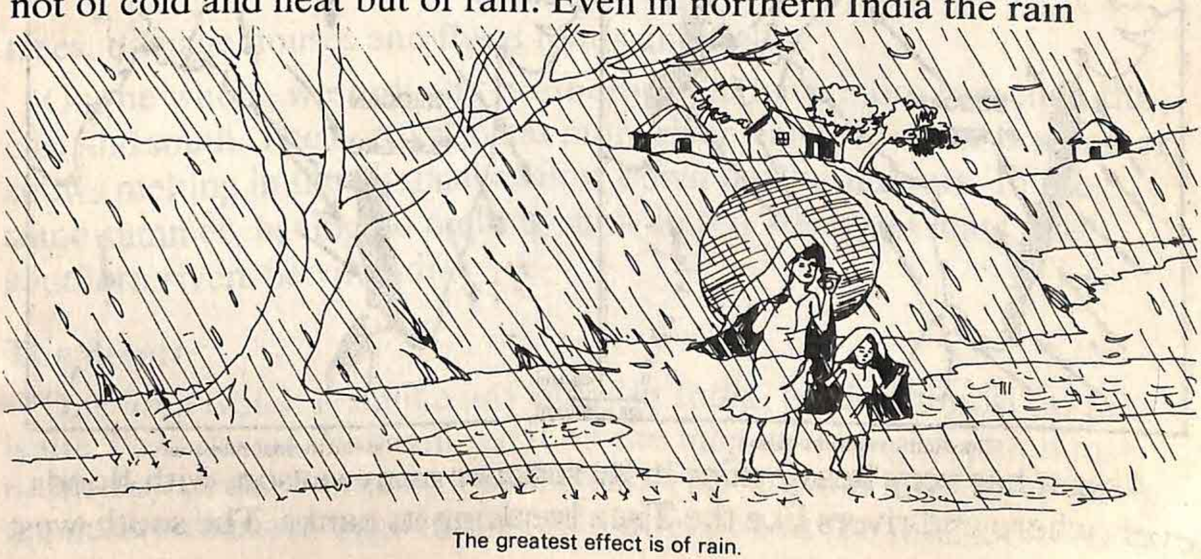
Summer



Autumn

In the peninsula

Peninsular India, however, does not have such hot summers nor such cold winters. It is much narrower than the northern plains, and no part is more than 500 km from the sea. Of course higher places are colder than lower ones, but there is no snow. The greatest effect is not of cold and heat but of rain. Even in northern India the rain

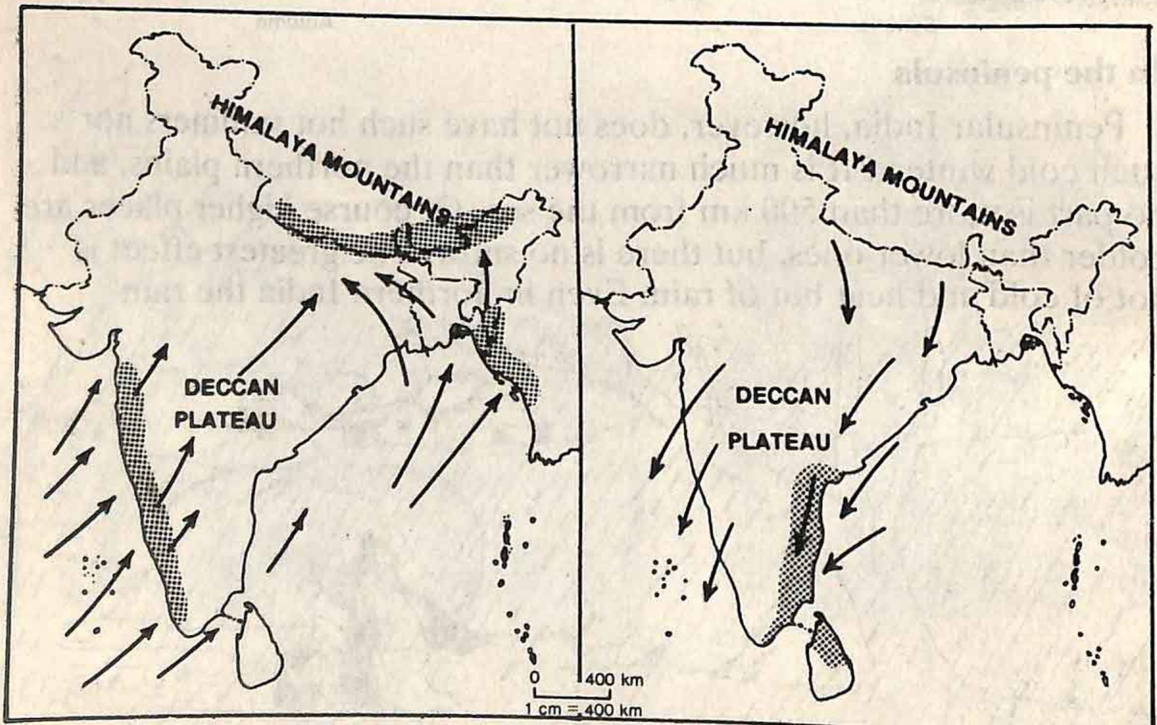


The greatest effect is of rain.

makes a change in the summer. So all over India the presence or absence of rain is the most important feature of its climate, and the event we anxiously wait for every year.

The south-west monsoon

These all-important rains come with two special winds called (from an Arabic word), the 'monsoons'. In summer the sun moves northwards and pulls along with it the winds of the south-west monsoon. They blow in summer from the south-west, off the Arabian Sea and the Indian Ocean below it, on to the west coast of India, and into the northern plains on their western and central parts. Coming from the south-west, they also pass the tip of south India and blow across the Bay of Bengal, get turned away at an angle by the Burma-Malaysia coast, and give their rain to the northern plains of India on their eastern and central parts. This south-west monsoon brings very heavy rain and much of India depends on it for water to grow its crops and fill up its lakes and rivers.



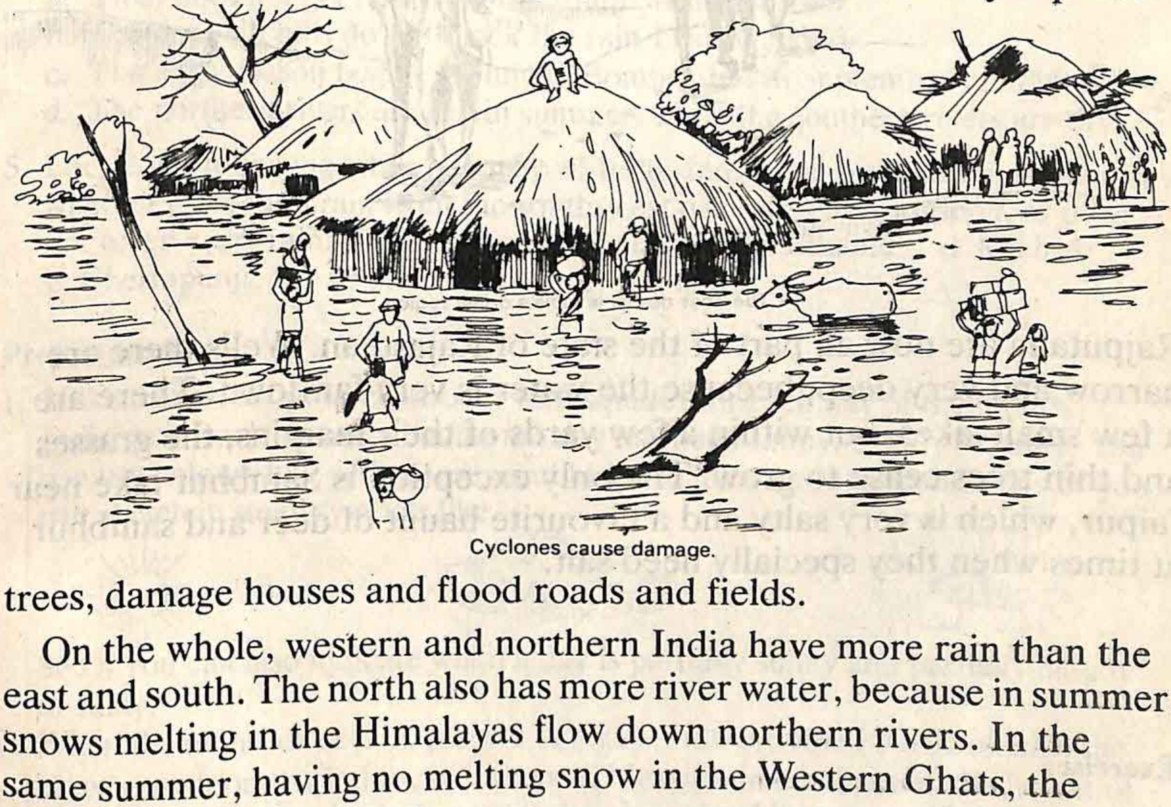
The south-west monsoon

The north-east monsoon

Assam has very heavy rains in its summer rainy season, with floods everywhere and rivers like the Tista breaking its banks. The south-west monsoon also makes the town of Cherrapunji the wettest place in the world.

The north-east monsoon

In September the sun moves south of the equator and these winds follow it, changing direction. Now they blow from the north-east and are called the north-east monsoon. They bring some rain to the east coast of India (to Orissa, Andhra, Tamil Nadu) and to east and north Sri Lanka. These rains have not crossed a great ocean like the Indian Ocean and bring less heavy and continuous rain to these areas. But they come sometimes as whirling cyclones and for a few days uproot trees, damage houses and flood roads and fields.



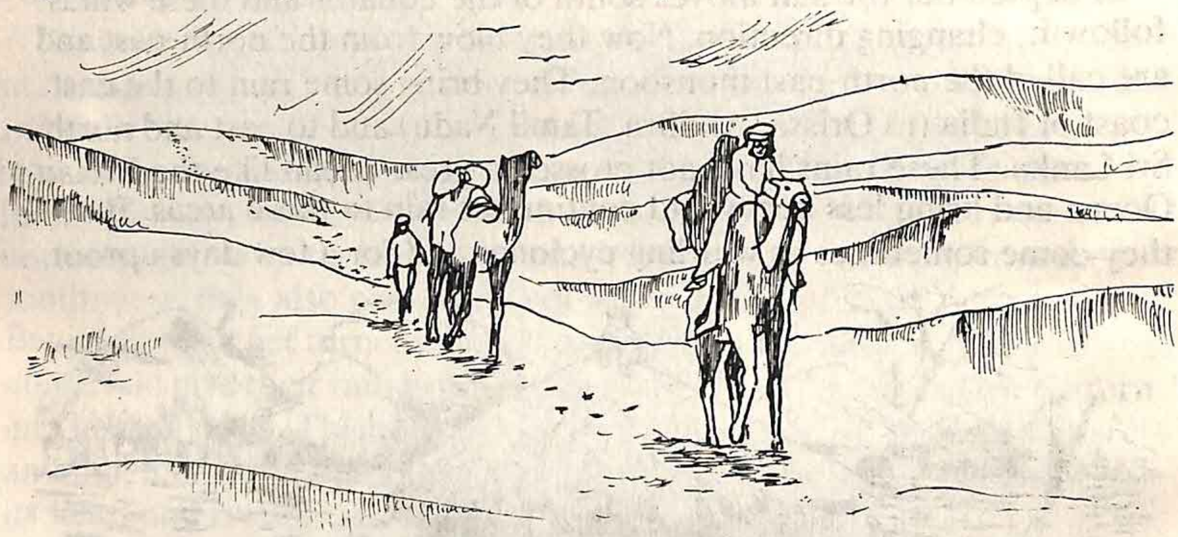
Cyclones cause damage.

On the whole, western and northern India have more rain than the east and south. The north also has more river water, because in summer, snows melting in the Himalayas flow down northern rivers. In the same summer, having no melting snow in the Western Ghats, the southern rivers become dry.

The desert

One area which is unlike any other in India, getting almost no rain, is the Thar desert. You will see it on the map as a longish patch just north-east of the Saurashtra peninsula. The Aravalli hills curve along the desert's eastern edge in the same direction as the monsoon winds.

They let the rain-bearing winds and clouds pass along them and, unlike the Western Ghats, do not block them and make them spill out the rain in their area. So nearabouts the Aravalli range is India's driest region, containing the Thar desert. Many well known cities of old Rajputana are now all part of the state of Rajasthan. Wells there are narrow and very deep, because the water is very far down. There are a few small lakes, but within a few yards of their margins, the grasses and thin trees cease to grow. The only exception is Sambhur lake near Jaipur, which is very salty and a favourite haunt of deer and sambhur at times when they specially need salt.



The Thar desert is India's driest region.

Exercises

1. Answer briefly:
   a. Which regions in India have four separate seasons?
   b. What is the most important feature of the climate of India?
   c. Name the two monsoons. When do they occur?
   d. What are the sources of water in the Rajasthan desert?
2. Fill in the blanks:
   a. Peninsular India is much ____________ than the northern plains and does not have such ____________ summers or such ____________ ____________.

b. The north-east __________ brings rain to the east coast states of __________ ; __________ and __________ .

c. The __________ hills do not block the rain-bearing clouds like the __________ Ghats. So, in this area, we find the __________ desert.

3. Match columns A and B:

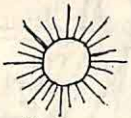
A	B
Cherrapunji	north-east monsoon
Rajasthan desert	salt lake
east coast	wettest place
Sambhur	narrow deep wells

4. Give reasons why:
   a. Tibet does not get rain from the south-west monsoon.
   b. The Aravalli hills do not block the rain-bearing clouds.
   c. The rainy season begins in June in Bombay but in September in Madras.
   d. The northern rivers are full in summer, while the southern rivers are dry.

5. Locate the following cities in a map of India and, from the position of each, say whether it receives rain from the south-west or north-east monsoon, or does not receive any rain. a. Bombay; b. Delhi; c. Bikaner; d. Madras; e. Cherrapunji; f. Bhubaneshwar; g. Jodhpur.

Project work

1. Make a chart for your classroom with squares for each day of the month. Indicate in each square whether the day has been sunny, cloudy or rainy. You can use colours like yellow, grey and black to indicate these conditions or you can sketch in small symbols like



See if you can also indicate when a day is partially sunny and partially cloudy or rainy.

2. When the monsoon sets in, place a straight, wide-mouthed bottle outside the classroom door or window, in the open. Measure in centimetres the height of rain-water collected in the jar every day. You should measure the water at the same time each day and empty the bottle after measurement. Note your findings in a chart each day.

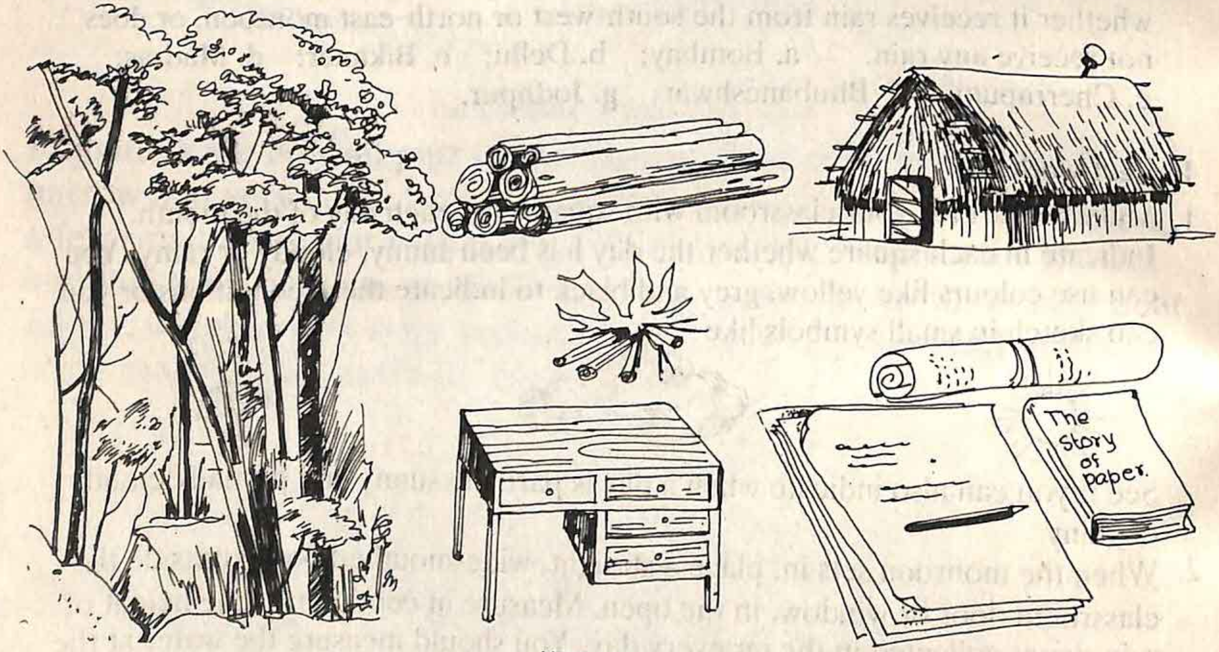
For both projects, compare the facts in your chart with the information in the weather report of the newspaper.

UNIT II *RESOURCES AND THEIR DEVELOPMENT*

5. Green gold

Everyone knows what yellow gold is; and oil, so useful in industry, is called black gold. But what everyone needs every day is not metal or petrol but food to eat. Vast fields of wheat, rice, barley, maize and vegetables are a country's essential wealth, and can be called green gold.

Another kind of green wealth (or green gold that is not man-made) is forests. They help to keep the soil moist and fertile, play a part in making rain, provide wood for fuel, paper, furniture and houses and produce leaves and flowers which we use in many ways.

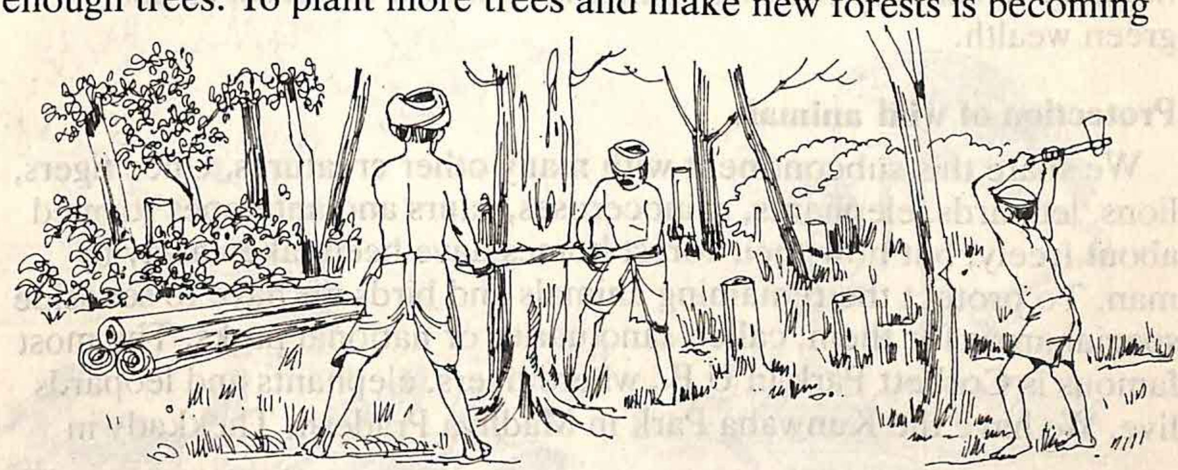

The Story of paper.

Uses of forests

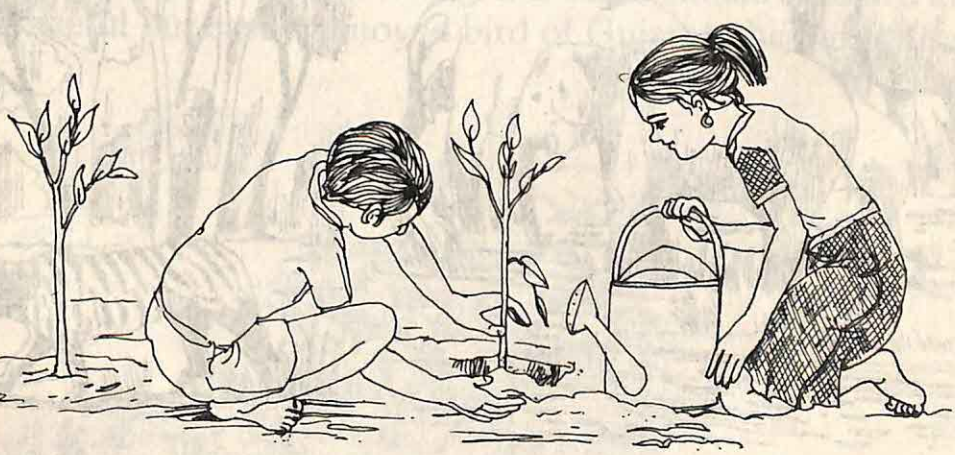
Forests are necessary

As more and more people are born and grow up, India's forests are being cut down to make room for houses to shelter them and fields to feed them. To have a healthy environment, a country needs to be 33 per cent (one third) forest. This is necessary to maintain a balance in nature. This is called the ecological balance.

With the felling of more and more trees, the soil loses its fertility. Forests also help prevent calamities like floods, drought and soil erosion. In India we have only 20 per cent (one fifth) of our land covered by forests and neither we nor the birds and animals have enough trees. To plant more trees and make new forests is becoming very necessary. It is very easy to cut down a tree, but it takes at least five years to grow one. In the Himalayas there is now an international movement called 'Chipko andolan', to prevent careless cutting of forests.



Felling trees can be harmful.

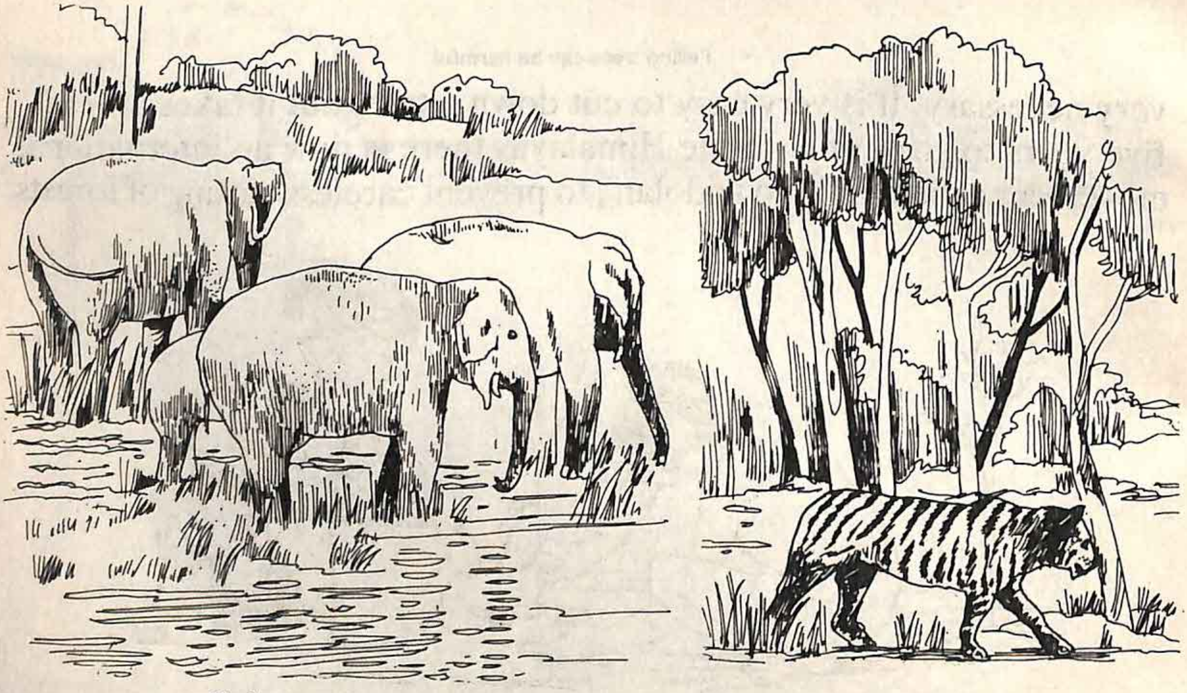


We should plant as many trees as possible.

Everyone, everywhere in India, has to consider how important trees and bushes are, and plant as many as possible — perhaps one every birthday. If you did so, you would be taking part in a Government of India plan called 'vanamahotsava' — festival of forests. To conserve forest wealth and the animal life within it, the government has set up a separate forest department. This department prevents illegal felling of trees besides protecting animals from poachers. Many organisations, such as schools and colleges, take up tree planting drives frequently, not only to beautify their surroundings but also to conserve this green wealth.

Protection of wild animals

We share this subcontinent with many other creatures. Once tigers, lions, leopards, elephants, rhinoceroses, gaurs and antelopes roamed about freely, but now their forest homes have been taken away by man. To protect the remaining animals and birds we have to set aside special areas for them, called sanctuaries or national parks. The most famous is Corbett Park in U.P., where tigers, elephants and leopards live. We have the Kunwaha Park in Madhya Pradesh, Thekkady in Kerala, Bandipur in Karnataka and Mudumalai in Tamil Nadu. The rhino lives in Assam, in the Kaziranga Sanctuary where the 'elephant grass' grows so high, it can hide a ten-foot jumbo. The Indian lion has its special home in the Girnar hills of Gujarat.

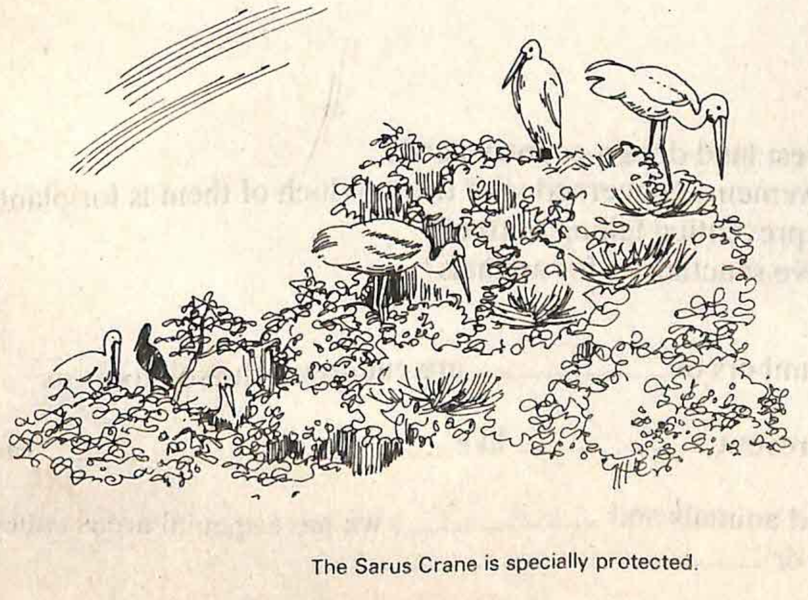


Elephants and tigers live in the Corbett Park and some other sanctuaries.

At Bharatpur near Gwalior, is a special lake home for water birds, some of which come for the winter from Northern Europe and Siberia. Vedanthangal in Tamil Nadu is also a bird sanctuary. Flamingoes have their special homes both at Point Calimere in Tamil Nadu and in the marshes of the Rann of Kutch, and there is a pelicanry in Andhra Pradesh. Specially protected birds are the Great Indian Buzzard and the very graceful but easily annoyed bird of Gujarat, the Sarus Crane.

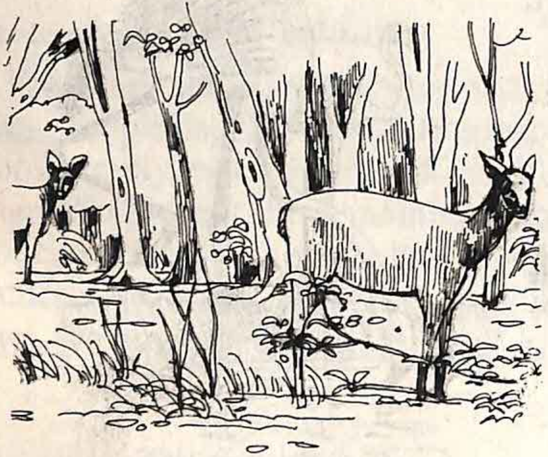
Pelicans

Flamingoes

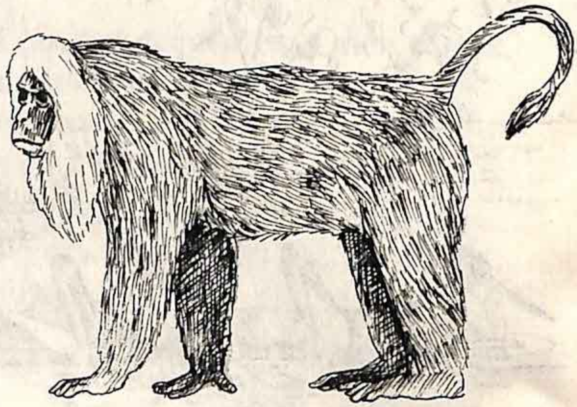


The Sarus Crane is specially protected.

In the Silent Valley in Kerala live not only ancient trees such as grew when the earth was younger, but the only kind (species) in the world of the lion-tailed monkey. Great efforts have been made to save the home areas (habitats) of all these plants and creatures so that they may continue to live on this planet along with man himself.



A sanctuary



The lion-tailed monkey

Exercises

1. Answer briefly:
   a. How much forest land does a country need?
   b. Name two movements concerned with trees. Which of them is for planting and which for preventing felling of trees?
   c. Why do we have sanctuaries for animals?
2. Fill in the blanks:
   a. When large numbers of ____________ are cut down, the soil loses its ____________ .
   b. Forests help prevent ____________ like ____________ , ____________ and soil erosion.
   c. To protect wild animals and ____________ , we have special areas called ____________ or ____________ ____________ .

3. Match the sanctuary with the state in which it is located:

Bandipur
Kaziranga
Kunwaha Park
Vedanthangal
Corbett National Park
Thekkady

Tamil Nadu
Uttar Pradesh
Karnataka
Kerala
Madhya Pradesh
Assam

Project work

1. On an outline map of India, draw or paste pictures of wild animals in their special home areas, for example, a tiger in Bengal.
2. Find out what the activities of the World Wild Fund (WWF) are. Choose any two of its projects and collect information about them. Make charts with maps of the places and pictures of the animals involved and write in the facts you have found out about each project.

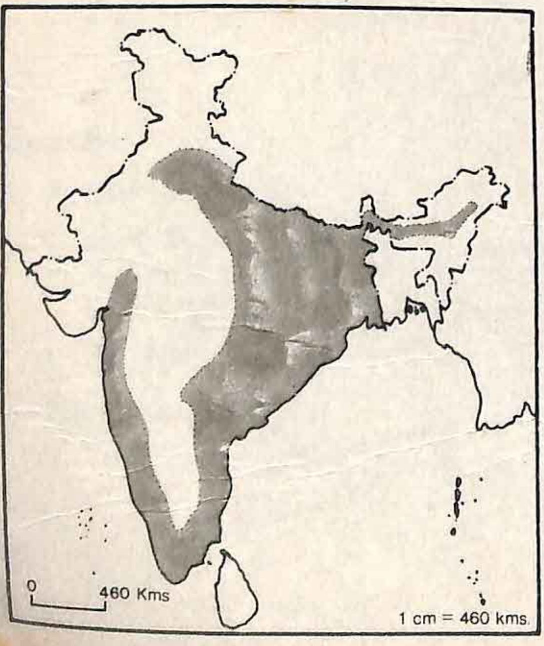
6. Our crops and domestic animals

THE CROPS WE GROW

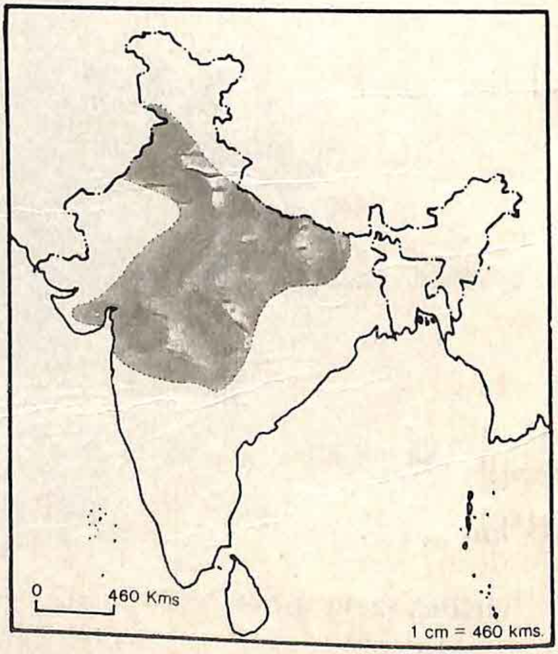
India is an agricultural country and has a great deal of man-made green wealth. Nearly 70 per cent of India's population depends on agriculture for a living. Over 70 varieties of rice are grown in Kerala, Tamil Nadu, Andhra, West Bengal and Punjab. Punjab, along with Haryana, Uttar Pradesh and Gujarat, also grows excellent wheat. The drier areas of most states grow ragi and millet. Pulses (dals) are sent all over India from Uttar Pradesh which also grows the most sugarcane, followed by Maharashtra, Gujarat and Tamil Nadu. West Bengal specialises in jute and, along with Kerala and Tamil Nadu, has large coconut groves. Outside big towns many villages grow all kinds of vegetables and flowers. Fruits, like apples, peaches, pears and pineapples, grow in colder areas like Kashmir and near hill stations.

Rice and wheat

The two important staple (basic) foodgrains grown in India are rice and wheat. Compare the two maps showing areas with rice or wheat



Rice-growing areas



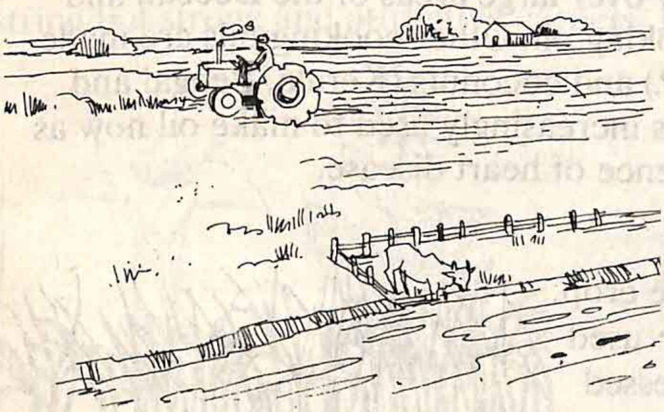
Wheat-growing areas

as the main crop. They are almost like pieces of a picture puzzle – put together, they make up one whole.

Transplanting rice

Rice

Rice grows more in the warm wet south and east, and wheat in the cooler north and west. West Bengal, Andhra, Kerala and Tamil Nadu are leading rice states while Punjab, Haryana and U.P. grow the most wheat.

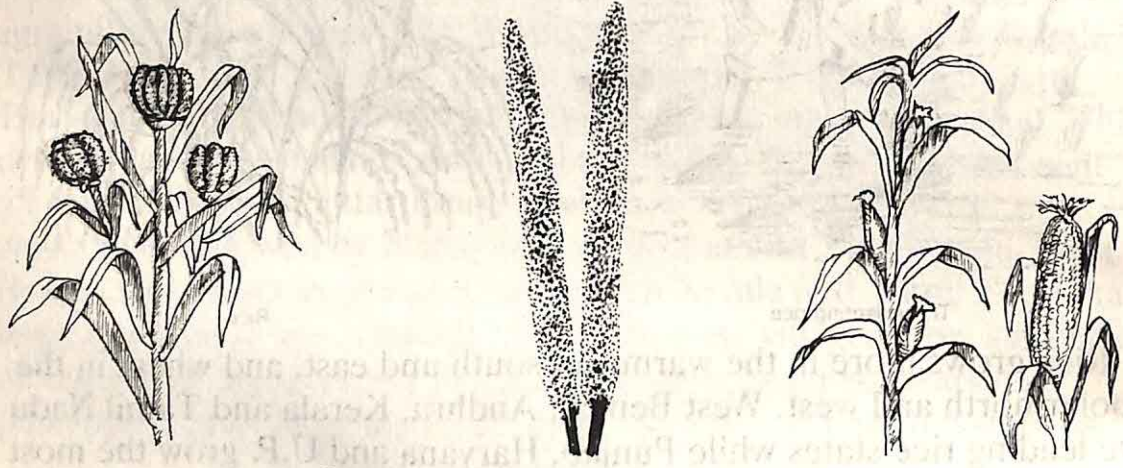

Wheat cultivation

Wheat

Farms in the south are mostly small and ploughs are pulled by cattle or mini-tractors. Water for the paddy fields is pumped up from bore-wells by electrical pumpsets, but often it also has to be pulled up by oxen. In Punjab and Haryana, farms are larger, ploughing is by tractor and harvesting by machine. Both states receive electricity from Bhakra Nangal and watering is done by electrical pumpsets. So farming and agricultural industries in these states are well advanced.

Ragi, bajra and maize

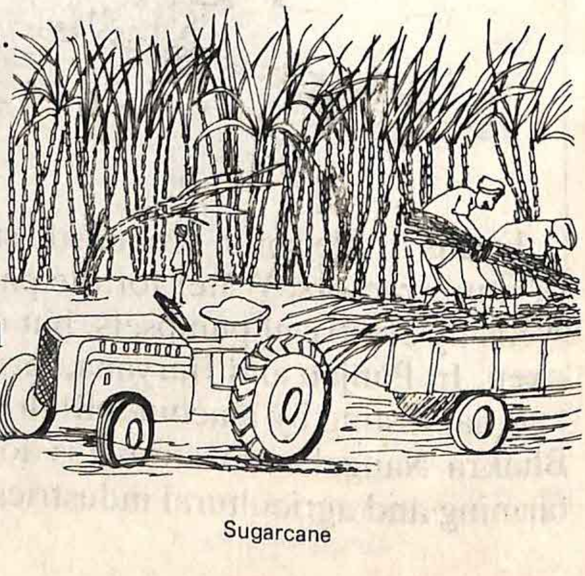
Crops like ragi, bajra and maize, which do not need very special soils, grow almost all over India, except in the Thar desert and the sandy stretches of Ramanathapuram in Tamil Nadu near the Cape. These grains are less expensive and healthier than mill-polished rice and wheat, and give some nourishment to the poor.



Crops like ragi, bajra and maize grow all over India.

Groundnuts and sesame grow over large areas of the Deccan and Gujarat and are pressed for cooking oil. Other cooking oils are made out of mustard (Bengal and U.P.) and coconuts (Kerala, Bengal and Maharashtra). Sunflower seed is increasingly used to make oil now as sunflower oil reduces the incidence of heart disease.

Sugarcane, coffee and tea

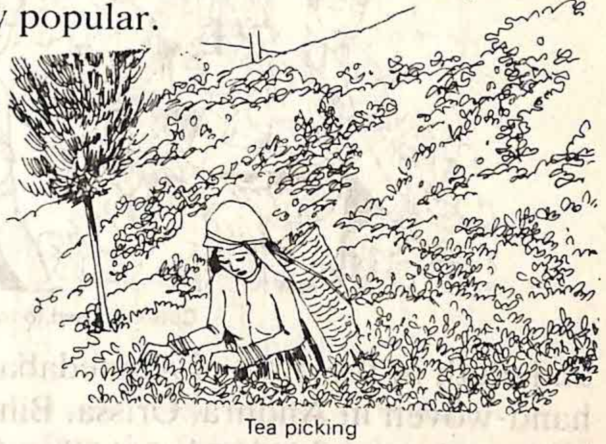


Sugarcane

Sugarcane is another valuable crop. Some of it is chewed as cane or used to extract juice; most of it is pressed and the extract is used to make molasses and sugar. The tough fibre (bagasse) is used to make paper.

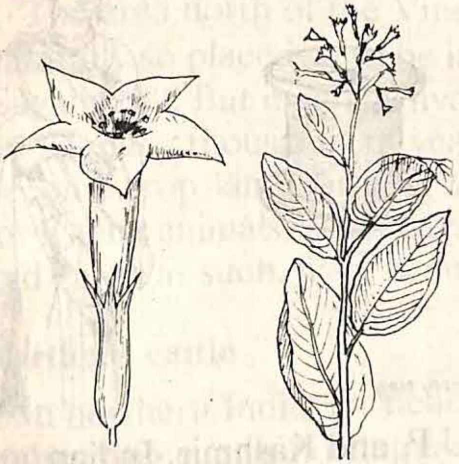
Coffee and tea need hill slopes and a cool climate and are cultivated in large estates in Wynaad (Kerala), Coorg (Karnataka), the Nilgiris (Tamil Nadu) and Assam. Darjeeling tea has a particularly delicate taste. India exports tea to most parts of the world where strong tea is preferred to the light Chinese tea. Coffee has to compete with the Brazilian variety but it does have an export market. In India, of course, it is very popular.

Coffee berries


Tea picking

Cash crops

Useful crops which one cannot eat are tobacco, jute and cotton. They are called 'cash crops'. Tobacco is chewed or smoked (even if harmful) and before chemicals became common, it was used as a pesticide to kill plant insects. Jute makes not only gunny bags and string but strong and attractive carpets. It is a rare crop, growing mainly in Bangladesh and India. In India it grows in West Bengal and nearby parts of Bihar and Assam and is in demand the world over.


Tobacco

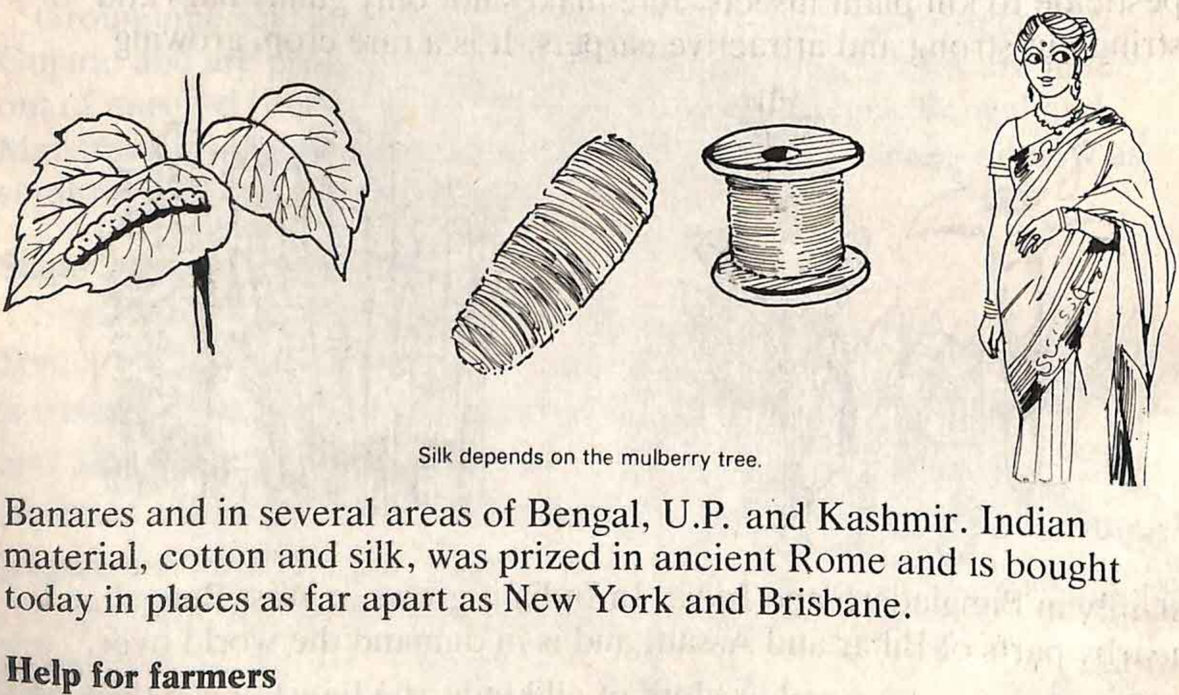
Jute

Cotton, of course, makes cloth of all kinds, the finest or the thickest. In ancient times Indian hand-woven muslin was a royal gift. Cotton grows in the 'black cotton' soil of the Deccan. It is made into yarn

Cotton is used to make cloth of all kinds.

and cloth in the mills of Ahmedabad, Sholapur and Coimbatore and is hand-woven in Andhra, Orissa, Bihar, Assam, Bengal and Maharashtra – that is, almost all over India – in attractive local patterns.

Silk, though not grown from the soil, also depends on a tree – the mulberry tree. Different kinds of silks are hand or mill woven into saris or dress and furnishing material in Kanchipuram, Bangalore,



Silk depends on the mulberry tree.

Banares and in several areas of Bengal, U.P. and Kashmir. Indian material, cotton and silk, was prized in ancient Rome and is bought today in places as far apart as New York and Brisbane.

Help for farmers

Some government institutions including banks extend loans to farmers to buy seeds, farming equipment, pumpsets and fertilizers.

Government helps farmers with advice and loans for seeds, pumpsets and fertilizers.

There are other institutions which offer the farmers advice on good seeds, type of crop to be grown and other farm activities. There are also government awards for the highest yield of various crops as incentives to farmers.

THE ANIMALS WE KEEP

The area north of the Vindhyas, in fact the entire Gangetic plain, is naturally so placed as to be ideal for grasslands (geographers call it 'Savannah'). But man has lived there, and along all the Indian rivers, for so many thousands of years that much of the grassland has become crop-land, farming land. Even so, some areas have been left for use by animals, especially the cow. From early Vedic days the cow and cattle as such, have been regarded as specially valuable property.

Northern cattle

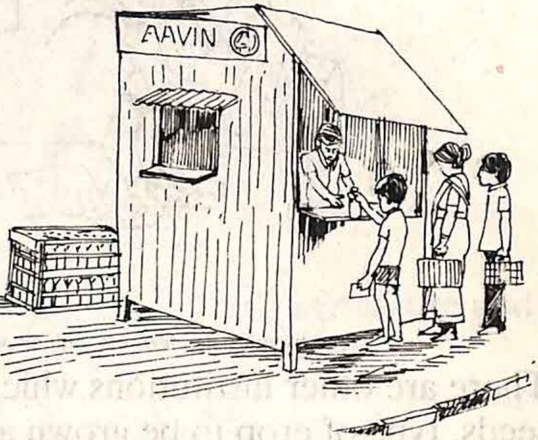
In northern India, particularly, with so many rivers and interconnecting canals flowing even in high summer, cattle can find fodder, even if their owner is too poor to buy much hay or oil cake for their feed. So the health and quality of northern cattle are generally much better than those of southern breeds (kinds of animals).

In fact, the first assistance Vietnam asked India for was not factories and railroads but 200 milk-giving Murrah buffaloes, to better the health of their cattle and start their own herds.

'Operation Flood'

With modern methods of preserving excess milk, factories have come up at Anand (Gujarat), making milk powder, baby foods and cheese, for sale all over India. Haryana has a State Milk Cooperative.

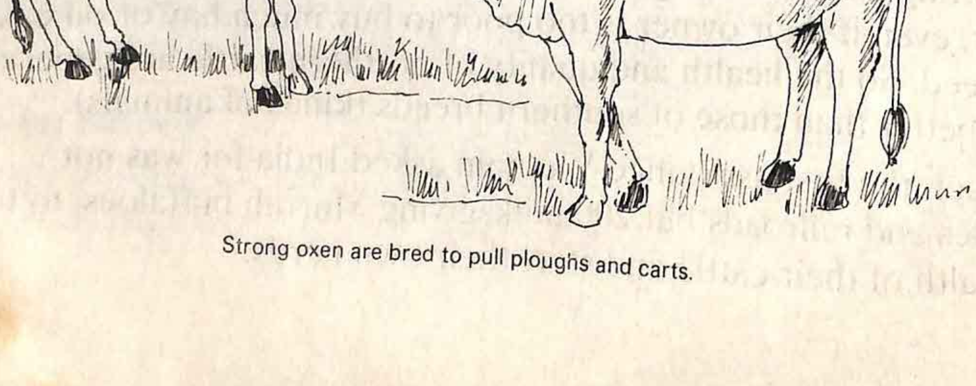
Factories make milk powder and other milk products.



The Tamil Nadu Government runs milk depots.

The Tamil Nadu Government is running milk depots and serving milk at public booths so that people may develop a taste for healthy foods. This is in spite of not having such good pasture land as in the north, as there is less water in the south. All this is part of Operation Flood, a project to increase the output, quality and consumption of milk and milk products in India.

The Ongole breed of oxen in Andhra is known for its strength. These oxen are used to strengthen many other breeds of cattle needed to pull ploughs and carts.



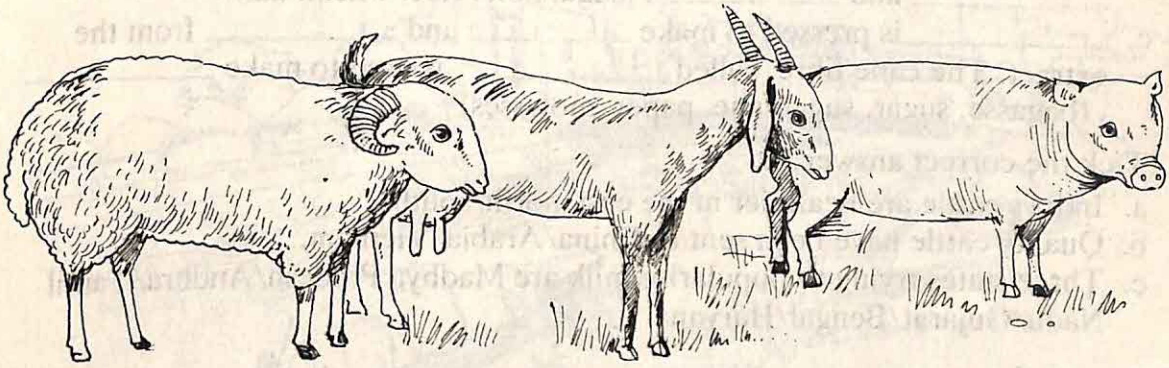
Strong oxen are bred to pull ploughs and carts.

More nourishment

With all this, it is sadly true that our cattle — as well as our people — need much more nourishment than they are getting. State farms are being set up in some places and it is a credit to a naturally waterless area that a model crop and cattle farm flourishes at Suratgarh in Rajasthan. This has been possible because a special network of channels — the Ganganahar — has been set up to help a very dry region, taking surplus water from the Rajasthan Canal.

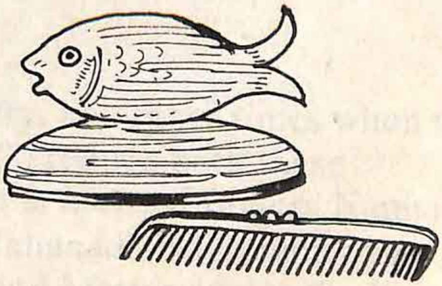
Other uses

Apart from meat and other foods, cattle and other animals — sheep, goat, pigs — provide hides for leather goods, wool for clothing, blankets and carpets, and special substances from their hooves. Their fat is used in cooking and cosmetics. Even their horns are useful for tool handles or as decorations.



Sheep, goats and pigs provide wool and hides for leather.

Animal fat is used in cosmetics.



Horn products.

Exercises

1. Answer briefly:
   a. What is the difference in the climate needed for rice and wheat growing?
   b. Name two rice-growing and two wheat-growing states. Which of the two groups use more advanced methods of farming?
   c. Name the model farm in Rajasthan. What has made it possible to establish the farm?

2. Fill in the blanks, choosing the right word from those given in brackets:
   a. Yellow gold is formed in rocky __________, black gold collects in underground __________ and green gold grows in open __________. (pools, fields, mines)
   b. Andhra Pradesh and Tamil Nadu grow large quantities of __________. India's __________ states are Punjab and Haryana. Uttar Pradesh produces __________ and __________. (sugarcane, rice, wheat, dal)
   c. __________ is pressed to make __________ and __________ from the extract. The cane fibre, called __________, is used to make __________. (bagasse, sugar, sugarcane, paper, molasses)

3. Tick the correct answer:
   a. India's cattle are healthier in the east/north/south.
   b. Quality cattle have been sent to China/Arabia/Vietnam.
   c. Three states trying to popularise milk are Madhya Pradesh/Andhra/Tamil Nadu/Gujarat/Bengal/Haryana.

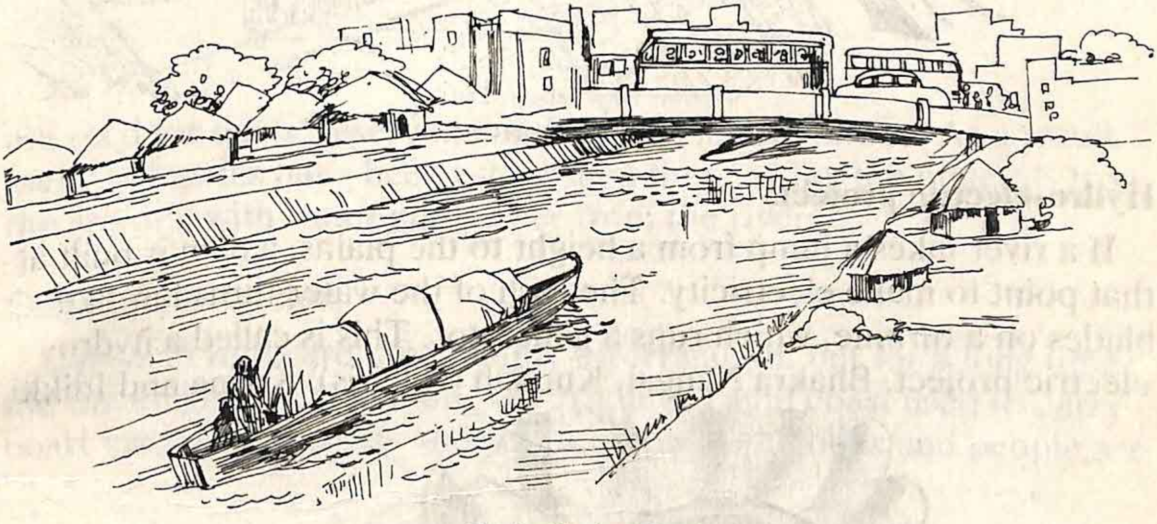
Project work

Visit, with your teacher, a farm where crops are grown or a dairy farm or milk cooperative. Observe and find out as much as you can about the products, methods, use of fertilizers or cattle feed, pest control, health of animals and other relevant topics. You can set up a classroom exhibition by making charts and models to illustrate the knowledge you have gained.

7. Water is put to work

Our rivers are not only pleasing to look at, they also have to work hard. Their two major tasks are 1. to water crops; and 2. to produce electricity.

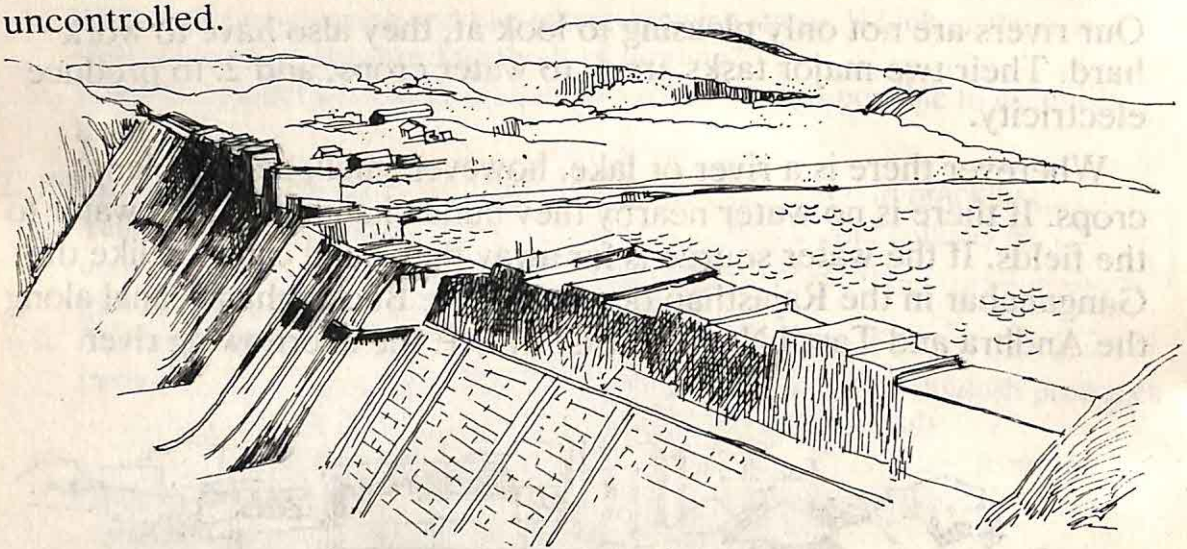
Wherever there is a river or lake, however small, people plant crops. If there is no water nearby they build channels to take water to the fields. If the water source is far away they build canals – like the Ganganahar in the Rajasthan desert and the Buckingham Canal along the Andhra and Tamil Nadu coasts. In U.P. the overflowing river waters run down numerous channels in mid-summer to provide water to a vast green area of fertile land.



The Buckingham Canal

Dams control flood waters

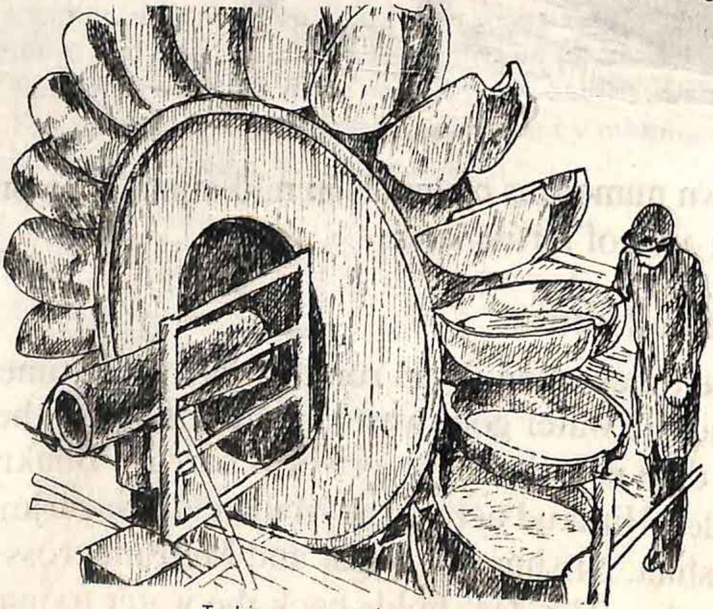
But there are times when rivers run dry, and other times when they are in flood and the water goes waste. To reduce both these possibilities, a dam is built where a river is narrow. Bhakra Nangal across the Sutlej, Hirakud across the Mahanadi, Nagarjuna Sagar across the Krishna, Krishnaraja Sagar and Mettur across the Kaveri are some examples. The dam holds back the water to make a lake (usually called a sagar), and water is released by a gate (a 'sluice') when needed. Flood waters can be held in the deep lake and let out slowly, to do less damage and more useful work than when uncontrolled.



The Kundah project

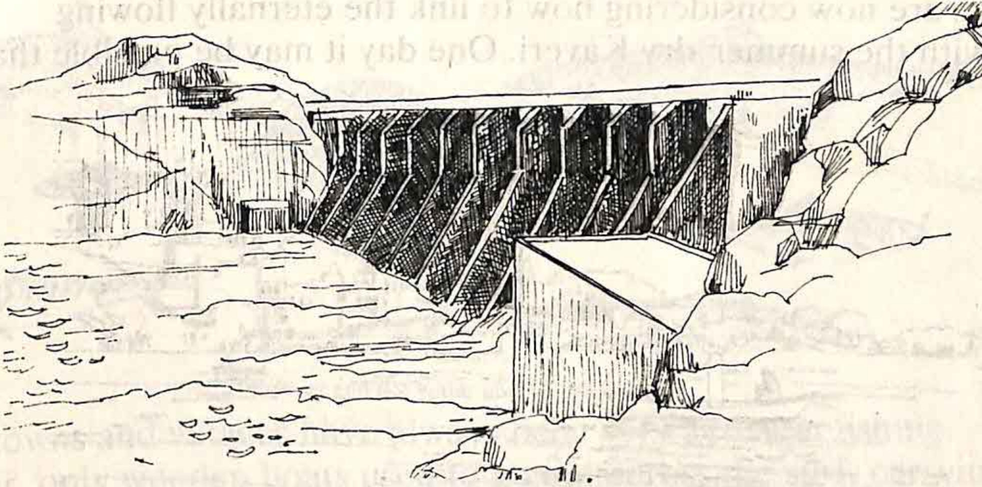
Hydro-electric projects

If a river takes a jump from a height to the plains, a dam is built at that point to make electricity. The rush of the water turns fan-like blades on a turbine, which runs a generator. This is called a hydro-electric project. Bhakra Nangal, Kundah (Nilgiris), Koyna and Idikki



Turbines are used to make electricity

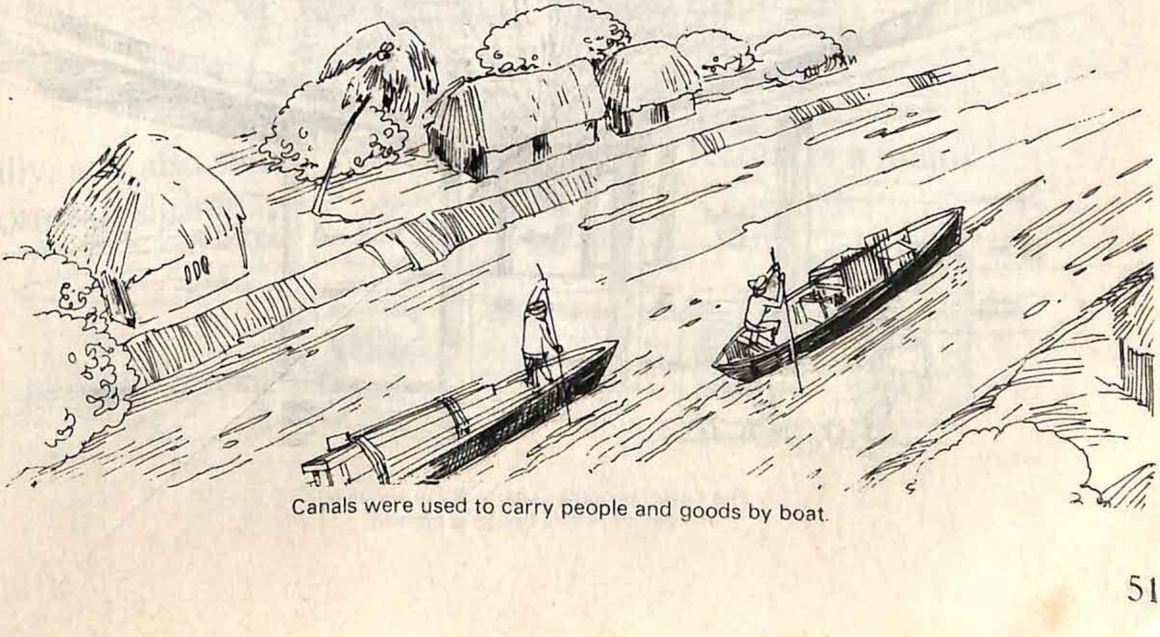
(Western Ghats) are such 'hydel' projects. Where there is a waterfall it is possible to run a hydro-electric project, if the quantity of water is sufficient. One of the biggest of such projects is in Bihar, called the Damodar Valley Project. The Damodar and its tributaries together are used for dams, reservoirs and hydro-electric power. As a result, many industries have been established there, using the minerals from the ground, with water and power from the rivers.



The Damodar Valley Project

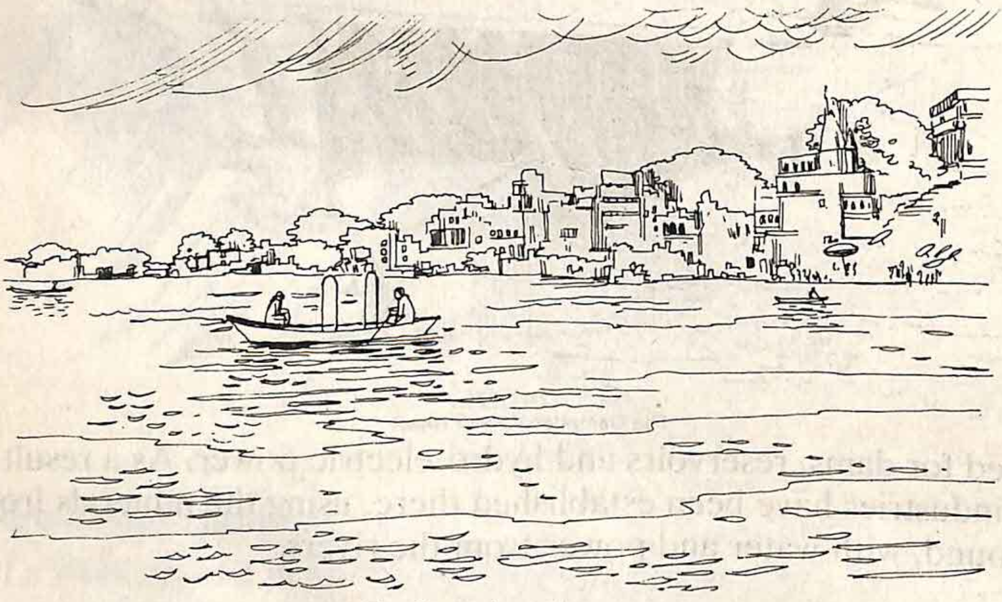
Canals for irrigation

Canals in India are used mainly for irrigation, but for a long time the Buckingham Canal along the Andhra-Tamil coast used to carry boats loaded with goods and people. Now both goods and people are

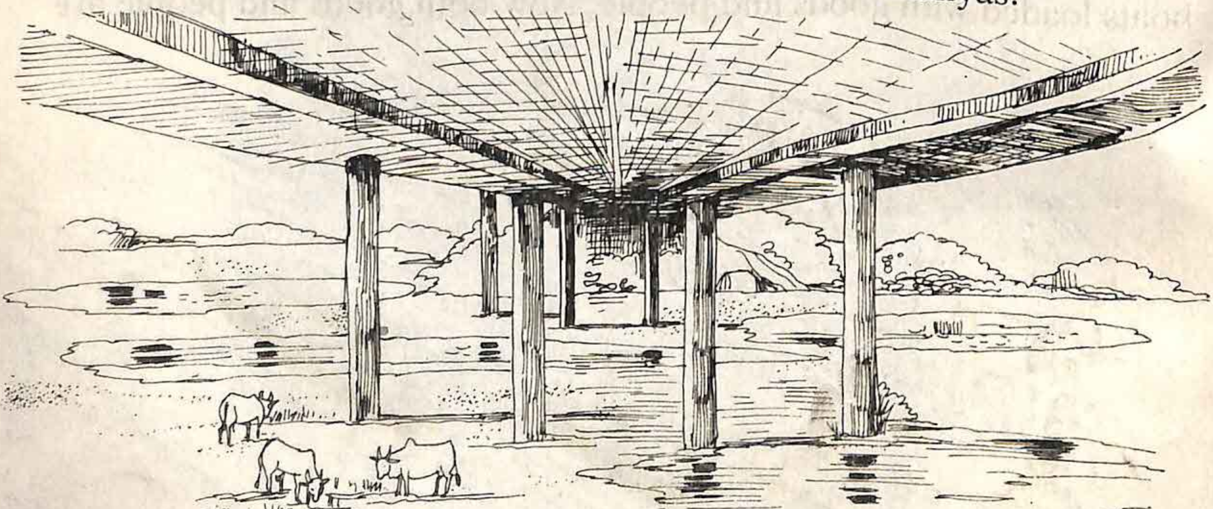


Canals were used to carry people and goods by boat.

carried by train or road and the canal is falling into disuse. A very important canal is the Rajasthan Canal, carrying water into the Thar desert to grow crops along its life-giving length. A very ambitious idea for a canal has been suggested but it is not yet a reality. Many engineers are now considering how to link the eternally flowing Ganga with the summer-dry Kaveri. One day it may be possible that the 'Ganga-Kaveri' canal may flow without ever becoming dry, making green thousands of miles of fields along its banks, and joining the north and south even across the barrier of the Vindhyas.



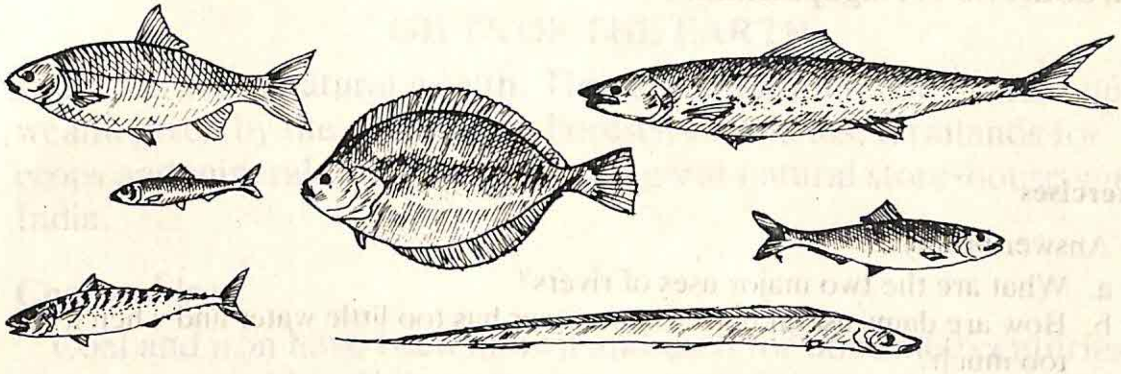
The Ganga always has water



The Kaveri becomes nearly dry in summer.

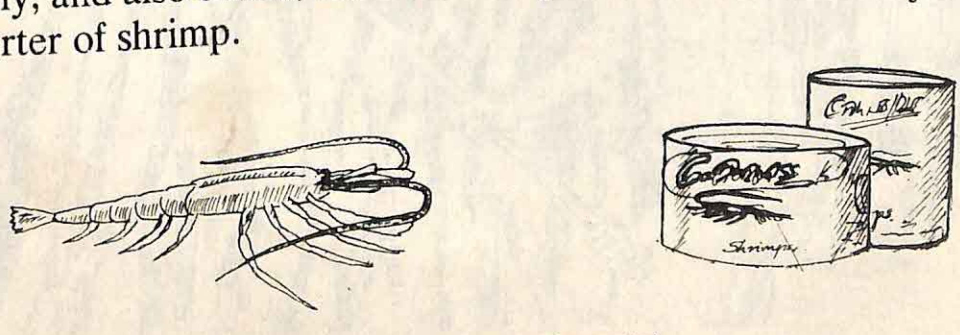
Food from river and sea

While river water gives us power and helps us to grow food, river and sea water give us another kind of food – fish. Along the coast,


River and sea water give us fish for food.

little towns and villages have always been very active in fishing. Earlier, only wooden boats used to go out across the surf, carrying a few men each. Now bigger boats with engines, dragging ('trawling') big nets along the sea-bed bring back large catches of fish. These are sold locally, and also salted, tinned and exported. Kerala is a major exporter of shrimp.

Some fish are sold locally.



Shrimp is tinned and exported.

In Bengal, where there are many little ponds, fresh water fish are reared for daily food. Tamil Nadu has a Fisheries Research Station at Mandapam near Rameswaram, and Tuticorin is a major fishing harbour. So is Nagapattinam.

Exercises

1. Answer briefly:
    - a. What are the two major uses of rivers?
    - b. How are dams useful both when a river has too little water and when it has too much?
    - c. Where is a turbine used? How does it work?
    - d. Name one product from the sea that Kerala exports.
2. Name the rivers across which the following dams or projects are built:
    a. Grand Anicut; b. Hirakud; c. Bhakra Nangal; d. Krishnaraja Sagar:
    e. Damodar Valley Project; f. Nagarjuna Sagar.
3. Give reasons why:
    - a. Hydro-electric projects are found in hilly regions rather than in flat plains.
    - b. It has been possible to bring parts of the Thar desert under cultivation.
    - c. The Ganga-Kaveri link will ensure that the southern river will never run dry.

Project work

Make a clay model of a waterfall with a dam across the river forming a lake. Get a photograph of a hydro-electric project and include as many details as possible in your model.

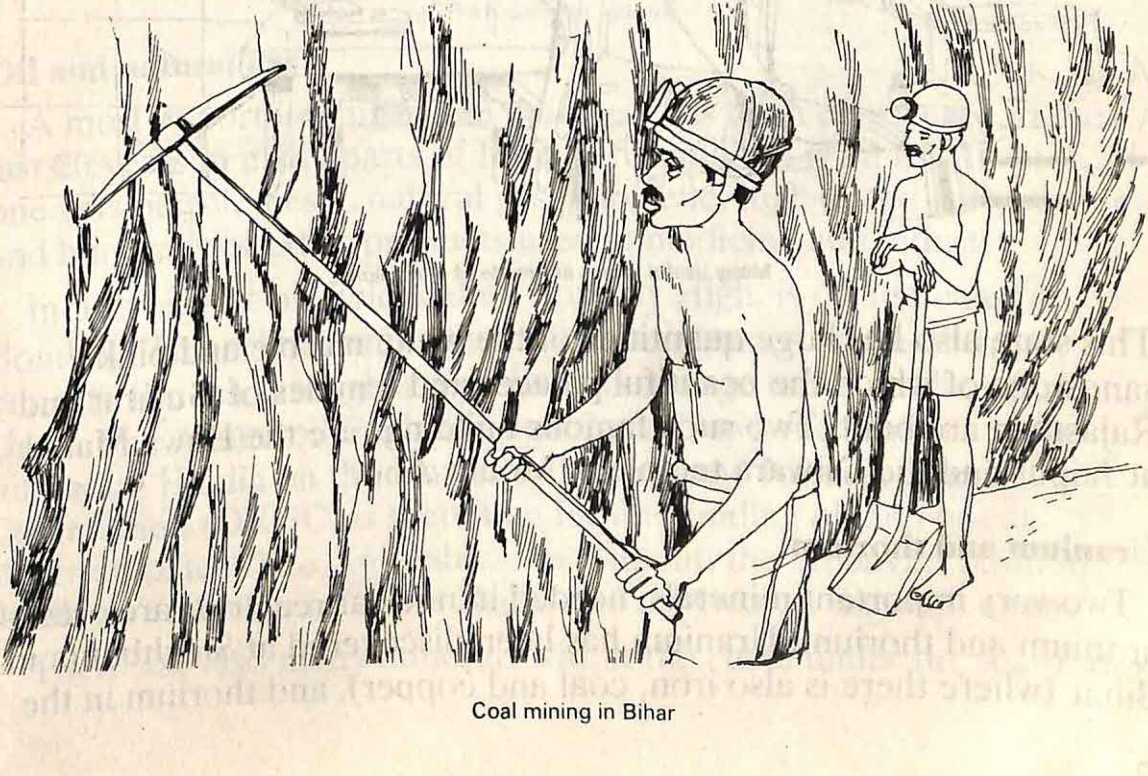
8. Our mineral wealth and industry

GIFTS OF THE EARTH

India has much natural wealth. This is not wealth made by man but wealth given by the earth itself. Forests, grasslands, farmlands for crops and minerals are all part of this great natural store-house within India.

Coal and iron

Coal and iron have been known and used for atleast 60 centuries as also copper, gold and silver. But in the last 150 years the world has learnt to use these, and most other earth-made substances, in different ways. In India we find uses for iron and steel in making ships (at Vishakhapatnam and Cochin); locomotives and railway coaches (Chittaranjan and Perambur, Madras); cars (Madras and Bombay). Large amounts of coal and iron are found in an area which spreads out into Orissa, West Bengal and Bihar. So steel making and coal mining are carried on as major industries at towns like Bhilai,



Coal mining in Bihar

Durgapur, Bokaro and Rourkela. Jamshedpur (named after J.R.D. Tata) is India's largest industrial town. High quality iron ore is found at Bailadilla close by and is being exported to countries both east and west of us.

Other minerals

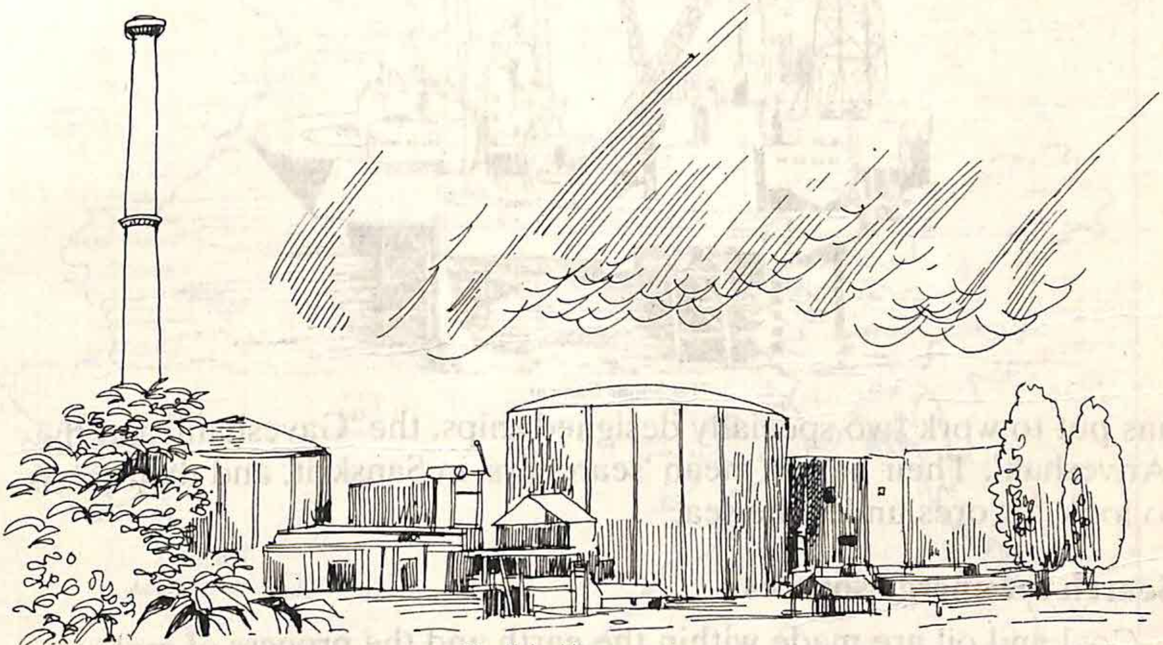
The same area also has copper, very useful for electrical wiring. Bauxite, an ore of aluminium from which one can make such different things as cooking vessels and Jumbo jets, is found in Bihar. Gold is mined at the Kolar Gold Fields in Karnataka and silver in Rajasthan.

Many useful things are made of aluminium.

This state also has large quantities of the white marble and pink sandstone of which the beautiful palaces and temples of Gujarat and Rajasthan are built. Two such famous buildings are the Hawa Mahal at Jaipur and the Dilwara temple at Mount Abu.

Uranium and thorium

Two very important minerals, needed in nuclear reactors, are ores of uranium and thorium. Uranium has been discovered at Singhbhum in Bihar (where there is also iron, coal and copper), and thorium in the monazite sands of Kerala. The Vikram Sarabhai Space Centre is established at Trivandrum and there are reactors at Kotah in Rajasthan and Tarapur near Bombay. Indian uranium is now used at the newest reactor at Kalpakkam, near Madras. All these reactors are meant to produce electricity, of which we do not have enough.



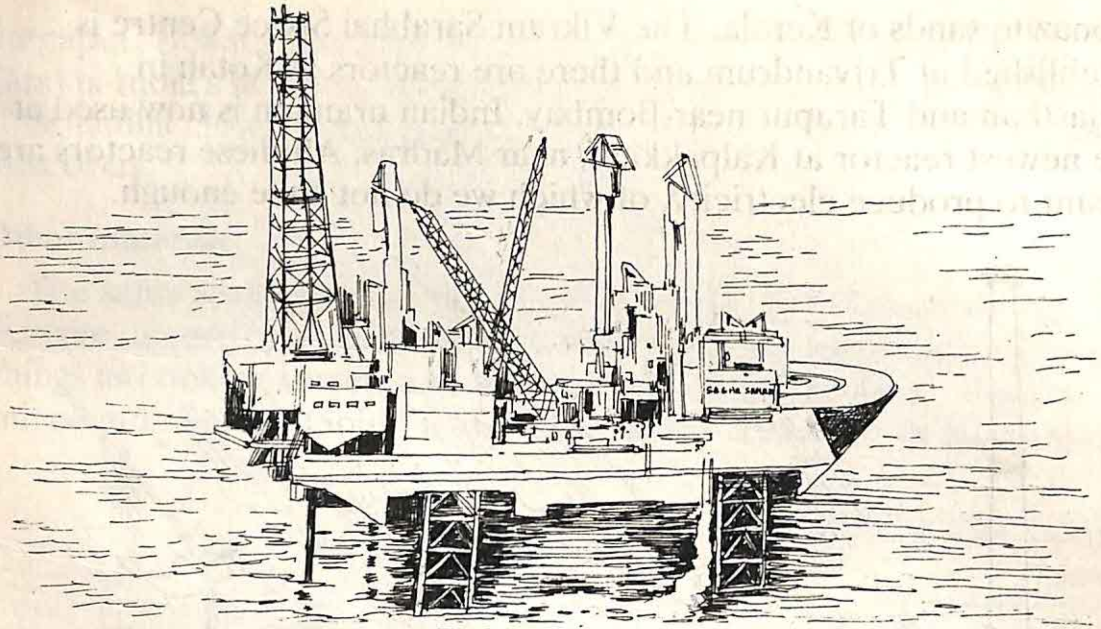
The Kalpakkam reactor

Oil and natural gas

A most important mineral in daily use has been discovered in the last 20 years in many parts of India. This mineral is oil from which one gets petrol, diesel, natural gas, kerosene, high-speed fuel, vaseline and hundreds of other products used in medicine and industry.

India's biggest oil-field, called Bombay High, is off the coast of Bombay. The drilling ship, 'Sagar Samrat', pumps crude oil from beneath the sea through a pipe-line, to storage tanks on the coast near Uran. The Assam oil fields of Digboi and Nowgong send oil to be refined at Haldia on the Hooghly. The Oil and Natural Gas Commission (ONGC) is searching for and finding oil and gas at different places like Ankleshwar in Gujarat, the Godavari basin in Andhra, Tuticorin in Tamil Nadu, and off Goa on the west coast.

There are also many minerals within the earth under the sea. India

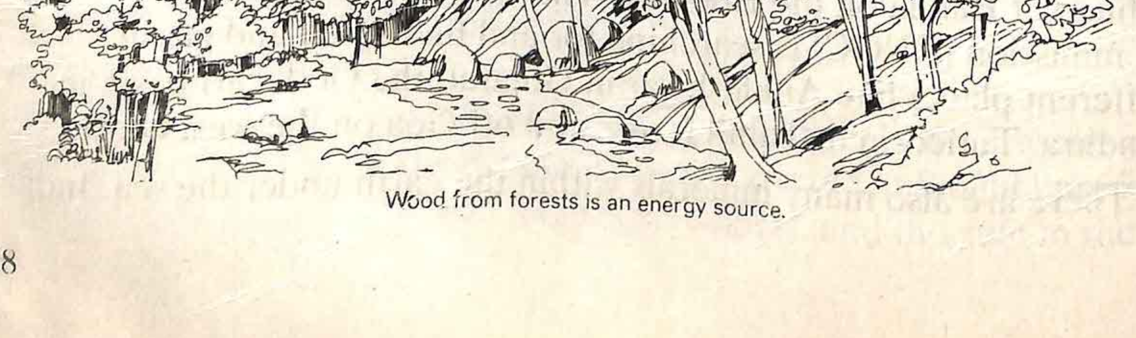


The Sagar Samrat

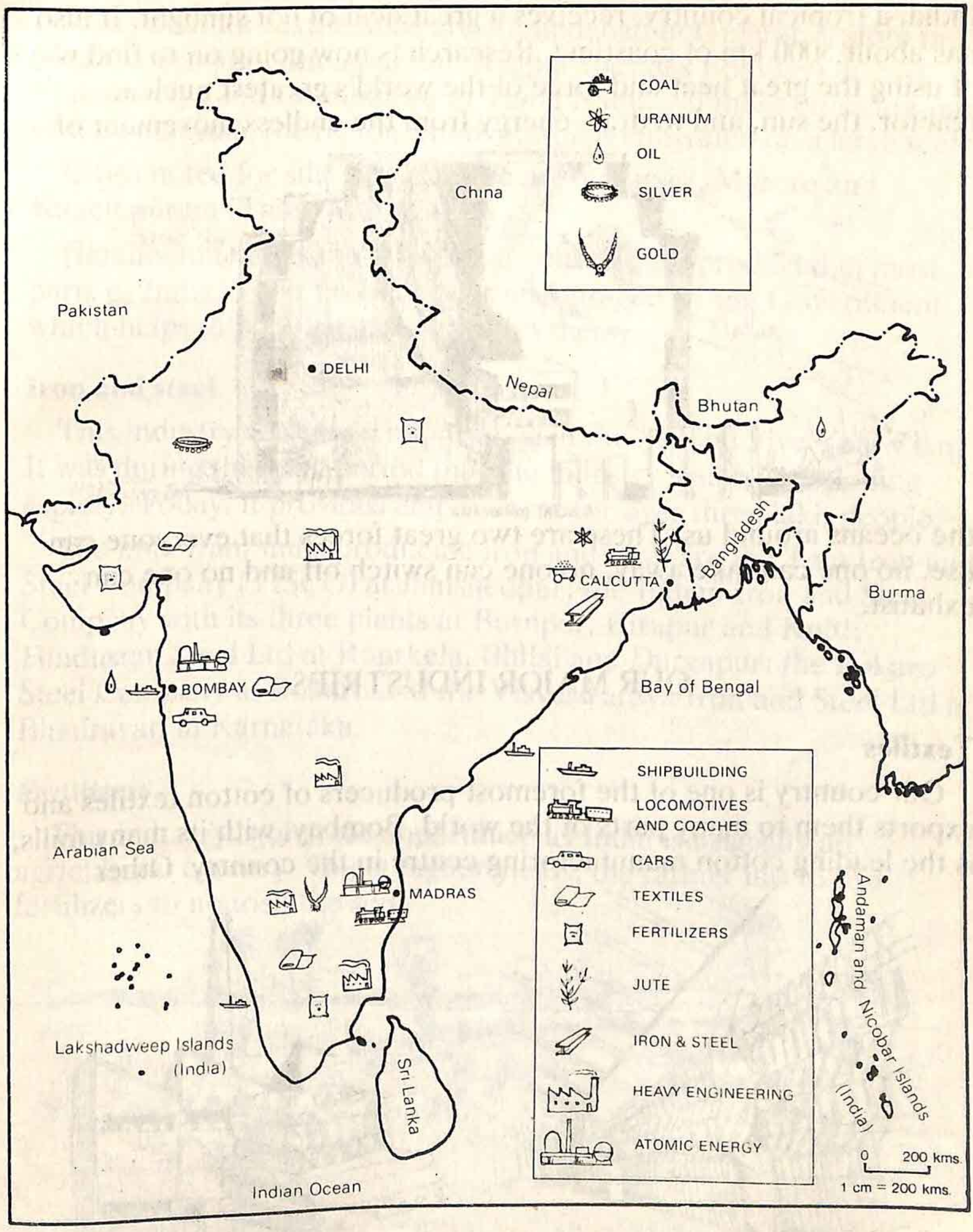
has put to work two specially designed ships, the 'Gaveshani' and the 'Anveshak'. Their names mean 'searchers' in Sanskrit, and their job is to look for ores under the sea.

Search for energy sources

Coal and oil are made within the earth and the process of making them takes millions of years. The world is using up these resources much faster than the earth can replace them. So there is a search on for other ways to produce heat and electricity (together called 'energy'). One way is to grow more forests and use the wood. Another is to use the heat of the sun itself, and the movement of the waves.

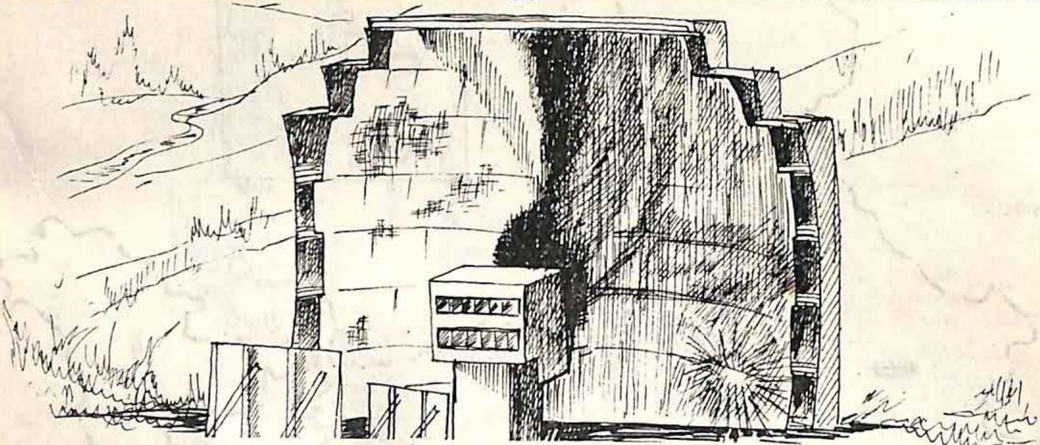


Wood from forests is an energy source.



Minerals and major industries.

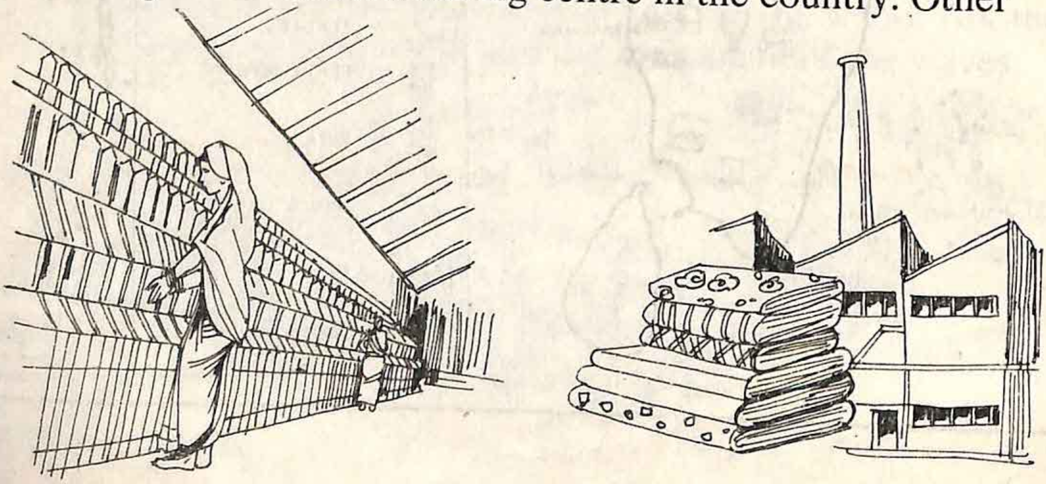
India, a tropical country, receives a great deal of hot sunlight. It also has about 5000 km of coastline. Research is now going on to find ways of using the great heat and force of the world's greatest nuclear reactor, the sun, and to draw energy from the endless movement of the oceans around us. These are two great forces that everyone can use, no one can take away, no one can switch off and no one can exhaust.


A solar generator

OUR MAJOR INDUSTRIES

Textiles

Our country is one of the foremost producers of cotton textiles and exports them to many parts of the world. Bombay, with its many mills, is the leading cotton manufacturing centre in the country. Other


India is a leading producer of cotton textiles.

places noted for textile mills are Ahmedabad in Gujarat, Indore in Madhya Pradesh, Sholapur and Nagpur (besides Bombay) in Maharashtra and Coimbatore in Tamil Nadu. All these cities are part of the peninsula, the region where cotton is cultivated on a large scale.

Cities noted for silk manufacture are Varanasi, Mysore and Kanchipuram (Tamil Nadu).

Handloom textiles, both in cotton and silk are produced in most parts of India. Their production is encouraged by the Government which helps to popularise and market them.

Iron and steel

This industry was given importance in the Second Five Year Plan. It was during this plan period that the industry started developing rapidly. Today, it provides employment for over three lakh people.

The important units producing iron and steel are the Tata Iron and Steel Company (TISCO) at Jamshedpur; the Indian Iron and Steel Company with its three plants at Burnpur, Hirapur and Kulti; Hindustan Steel Ltd at Rourkela, Bhilai and Durgapur; the Bokaro Steel Company at Bokaro and the Visveswaraya Iron and Steel Ltd at Bhadravati in Karnataka.

Fertilizers

This industry is of great importance as India is basically an agricultural country. To get higher yields, the farmer has to use fertilizers to nourish the soil.

The farmer uses fertilizers to nourish the soil.

The Fertilizer Corporation of India is the leading producer of fertilizers in our country. It has its units at Sindri, Nangal, Trombay, Gorakhpur, Durgapur and Namrup. The company has also set up units at Barauni, Talcher and Ramagundam.

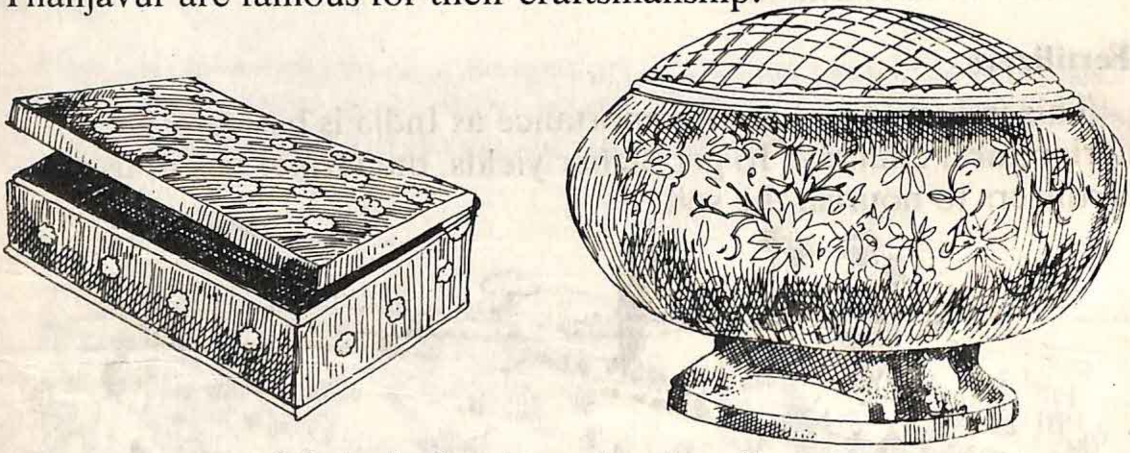
Other companies producing fertilizers are Fertilizers and Chemicals, Travancore, Madras Fertilizers, Hindustan Steel at its three units and the Neyveli Lignite Corporation. Most steel plants produce fertilizers as a subsidiary activity.

Though the fertilizer manufacturing units are widely distributed, the highest concentration is in Tamil Nadu, Uttar Pradesh, Gujarat and Kerala, the first being the leading producer of fertilizers in the country.

Handicrafts

Indian handicrafts are known all over the world and have a good market abroad. Indian craftsmen produce a wide range of handmade articles – from giant temple lions to ornamental cuff links.

The enamelware of Jaipur, the flower vases of Moradabad, the nirmal work of Hyderabad, the bidriware in Bidar and the metal plates of Thanjavur are famous for their craftsmanship.



Indian handicrafts are famous all over the world.

The Indian Government set up the All India Handicraft Board in 1952 to improve the production and marketing of handicrafts. The Board has its headquarters in Delhi and regional offices at Bombay, Calcutta, Delhi, Lucknow and Madras. Besides these, there are four design centres in Bangalore, Bombay, Calcutta and Delhi.

The Central and State Governments have set up over 250 handicrafts emporia all over the country to promote and market handicrafts.

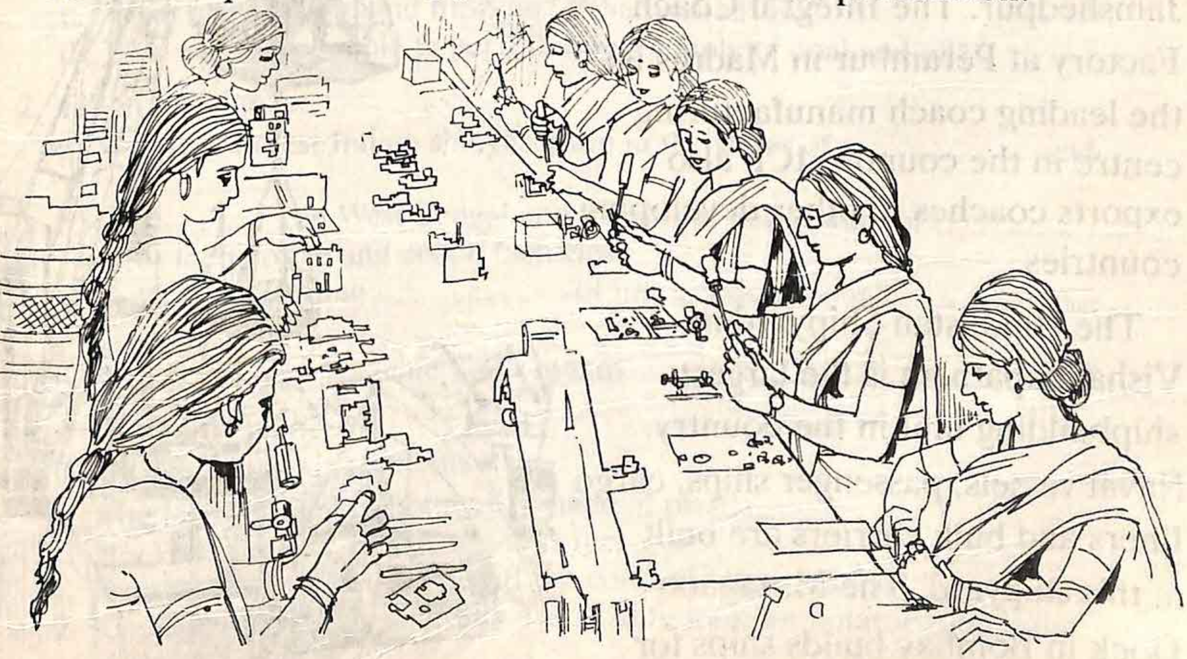
Some other important industries

India is the leading manufacturer of jute goods in the world although Bangladesh grows more jute. India also has the maximum number of jute mills, mostly concentrated in West Bengal. Jute is exported to countries like the USA, USSR, UK, Canada and Australia.

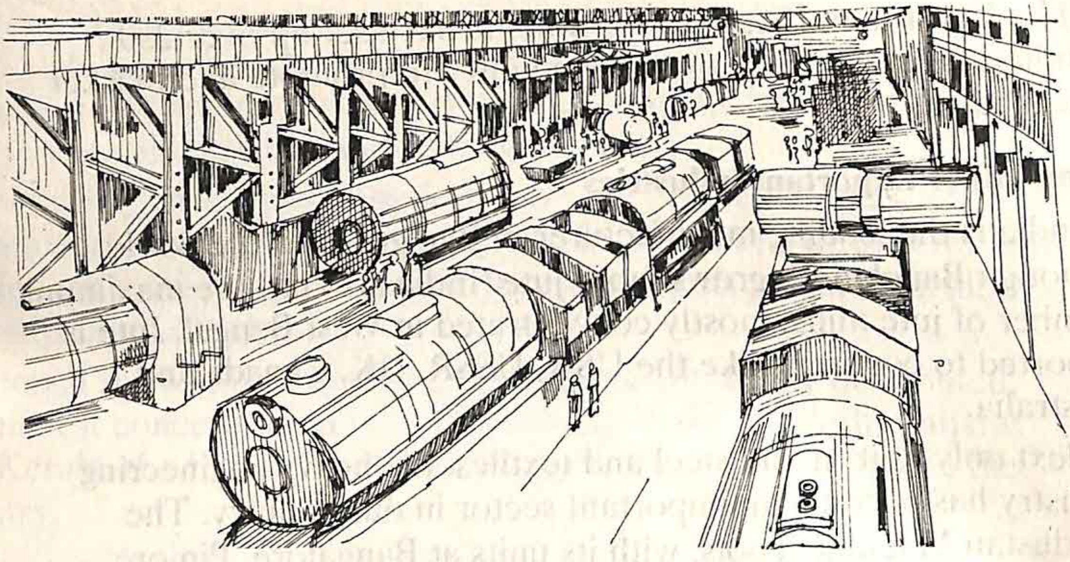
Next only to iron and steel and textiles, the heavy engineering industry has become an important sector in our country. The Hindustan Machine Tools, with its units at Bangalore, Pinjore, Kalamassery and Hyderabad, is the largest manufacturer of machine tools. The company also manufactures watches. The Bharat Heavy Electricals Limited, which manufactures heavy electrical equipment, has its units at Bhopal, Tiruchirapalli, Hyderabad and Haridwar.

Locomotive works and shipbuilding

India occupies a leading position in locomotive production.



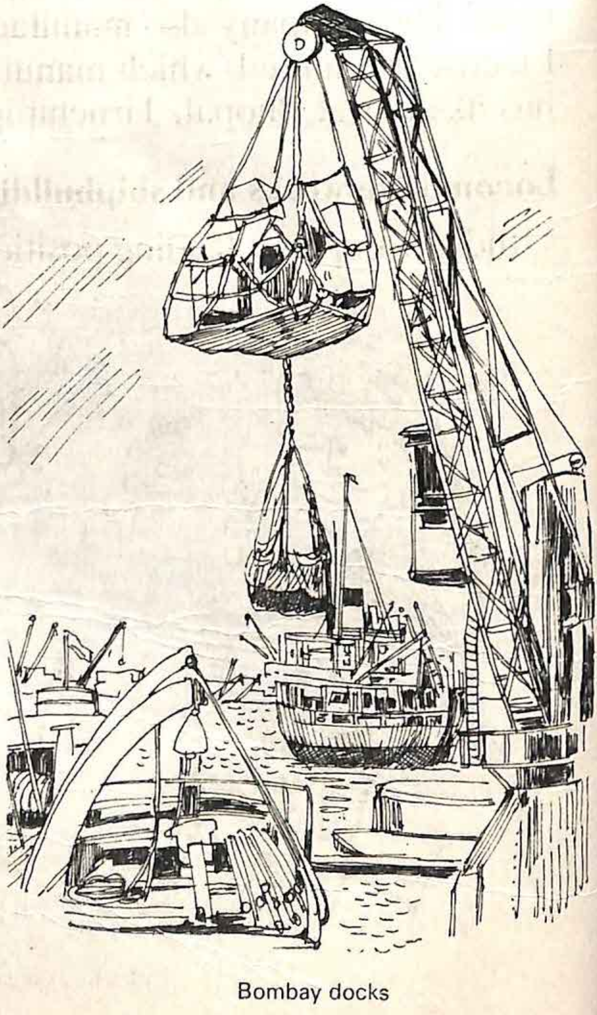
Watchmaking at HMT, Bangalore



The Chittaranjan Locomotive Works

Locomotives are produced at the Chittaranjan Locomotive Works, Diesel Locomotive Works, Varanasi and the Tata Engineering and Locomotive Company (Telco) at Jamshedpur. The Integral Coach Factory at Perambur in Madras is the leading coach manufacturing centre in the country. ICF also exports coaches to other developing countries.

The Hindustan Shipyard in Vishakhapatnam is the largest shipbuilding unit in the country. Naval vessels, passenger ships, cargo liners and bulk carriers are built in this shipyard. The Mazagaon Dock in Bombay builds ships for the Navy.



Bombay docks

Nuclear energy

With power consumption rising rapidly and with diminishing sources of energy, man has had to turn to unconventional sources of energy. Two forms of energy which could solve the problem are solar energy and nuclear energy. Already many countries including India have set up nuclear plants to generate electricity. Many countries are also working on ways to tap solar energy.

India has nuclear reactors at Trombay in Maharashtra and Kalpakkam in Tamil Nadu. In setting up nuclear plants many safety measures have to be implemented as radiation can cause a lot of harm to human beings. Nuclear energy can be used for both destructive and peaceful purposes. India uses nuclear energy for peaceful purposes.

Exercises

1. Answer briefly:
   - a. Name four minerals that are found in Bihar.
   - b. Which metal is used in the making of aeroplanes?
   - c. What are uranium and thorium? What is their use?
   - d. Why is it not possible to get a limitless supply of coal and oil?
2. Fill in the blanks:
   - a. The two largest Indian shipyards are in the states of __________ and __________ .
   - b. __________ in West Bengal and Perambur in the state of __________ have locomotive and coach factories.
   - c. India is the leading __________ of jute goods although __________ grows more __________ .
   - d. The Hindustan Machine Tools makes __________ __________ and __________ .
3. Correct the following statements:
   - a. The Hawa Mahal in Bombay is made of plastic.
   - b. Nuclear reactors use hot water as fuel.
   - c. Bombay High is a rice field off the coast of Uttar Pradesh.
   - d. 'Gaveshani' is a ship specially designed to look for potatoes under the Western Ghats.
   - e. Energy from the moon and water taps may be used in the future.

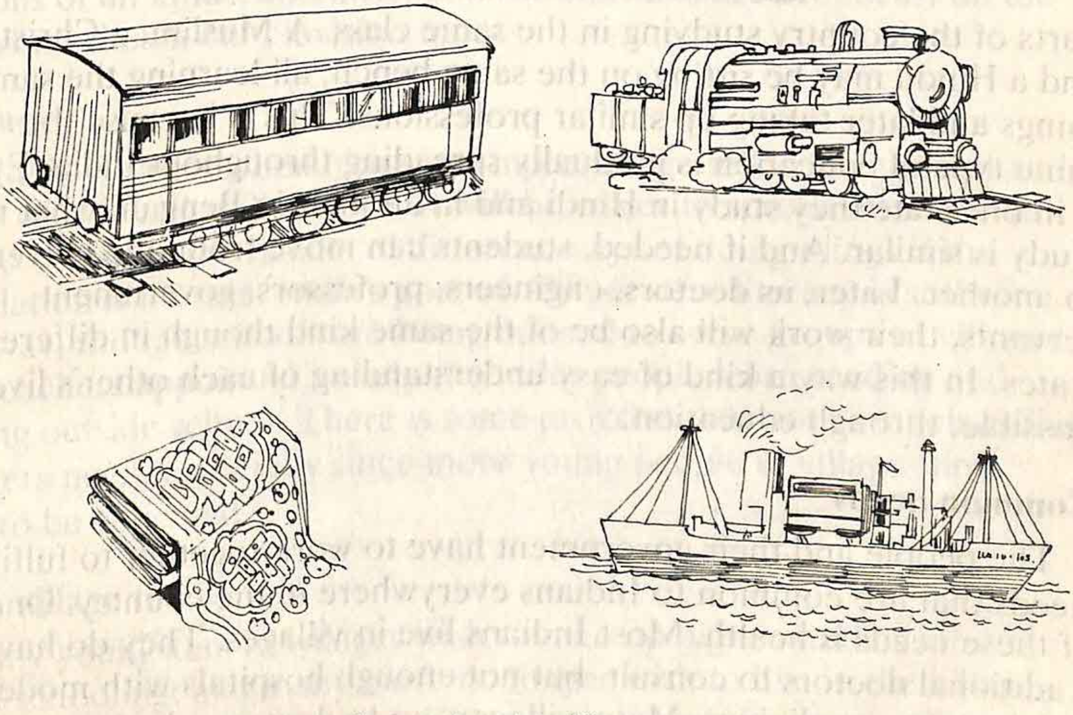
4. Which industry
    a. Produces nourishment for the soil
    b. Converts a cash crop into clothes
    c. Was given great importance in the Second Five Year Plan
    d. Employs skilled craftsmen and is promoted by the government
    e. Is located at Kalpakkam and Trombay.

Project work

Find out how coal and oil are formed inside the earth.

9. Pulling together

You would have heard the story of the man who gave his sons a bundle of sticks and asked them to break it. They could not. But when the sticks were taken one at a time, they could easily break them. There is also the saying "United we stand; divided we fall". Each part of India has some special crop, metal, mineral, industry, skill or physical advantage (like a cool climate or a natural harbour). But no part has every advantage, industry or skill, and each needs the others for the goods it does not have – clothes from Ahmedabad, wheat from Punjab, rice from Andhra and Tamil Nadu; ships from Bombay, locos from Bengal, coaches from Madras, planes from Bangalore; and many other things from different parts of the country.

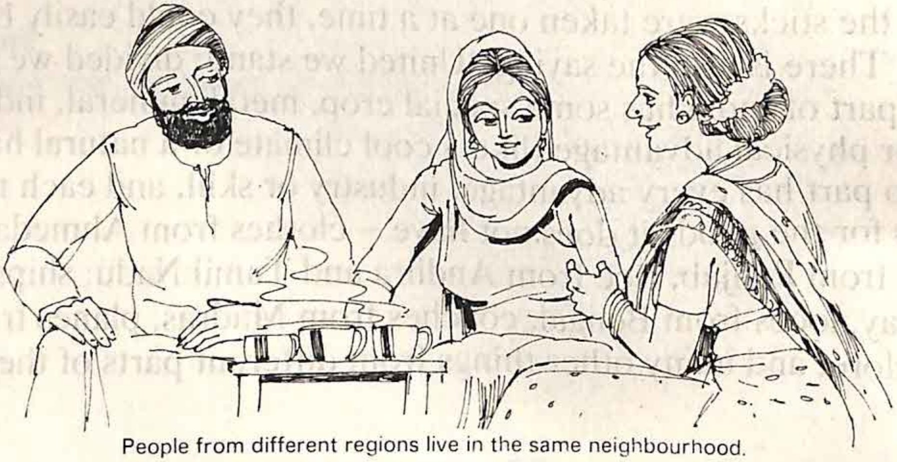


We need and use goods made in different parts of the country.

Several institutions are common to all the states. We share our train, air and road services, our army, navy and air force, our Parliament, and our Supreme Court.

Movement of people

One special way this sharing is done is by the movement of people. In any big town you will find people from different regions – for example, Tamils, Malayalees and Punjabis – living in the same neighbourhood. City schools have children coming from different parts of the country studying in the same class. A Muslim, a Christian and a Hindu may be sitting on the same bench, all learning the same things and later taking up similar professions. This is because the same type of education is gradually spreading throughout India. Even if in one state they study in Hindi and in another in Bengali, what they study is similar. And if needed, students can move from one university to another. Later, as doctors, engineers, professors, government servants, their work will also be of the same kind though in different states. In this way a kind of easy understanding of each other's lives is possible, through education.



People from different regions live in the same neighbourhood.

Common needs

The people and their government have to work together to fulfil the needs that are common to Indians everywhere in the country. One of these needs is health. Most Indians live in villages. They do have traditional doctors to consult, but not enough hospitals with modern quick-acting medicines. Many villagers go to doctors who know only the old Indian medical systems, like Ayurveda, Unani and Siddha. But if the illness is of a certain nature, modern medicines of the allopathy system are sometimes needed. It would be difficult to establish large

Many villagers go to doctors who practise the old Indian systems of medicine.

hospitals everywhere. But many states are training village workers to teach villagers hygiene and look after their health needs. Veterinarians are appointed to look after the animals in groups of villages. Development Officers and Extension Officers are appointed to help farmers get a higher yield of crops from the same land. Lessons of all kinds, and instructions to farmers are broadcast on the radio and shown on television too.

Literacy

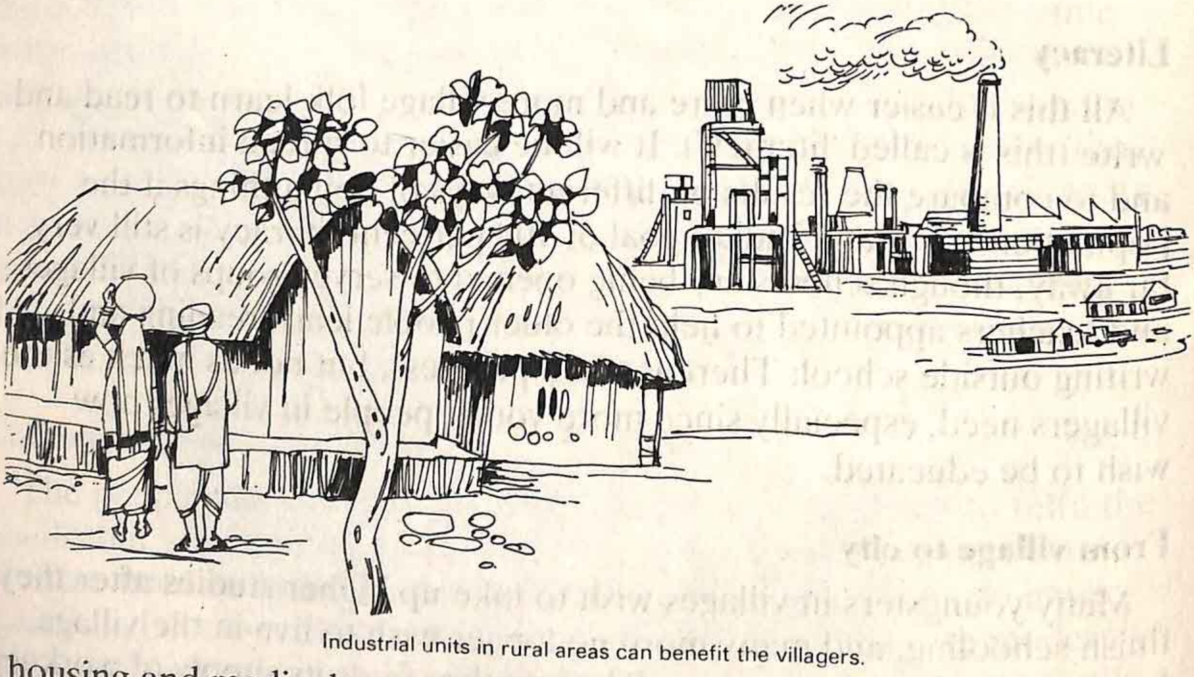
All this is easier when more and more village folk learn to read and write (this is called 'literacy'). It will be easier to spread information and to compare the results of different ways of doing things if the population is literate. India's goal of 100 per cent literacy is still very far away, though schools are being opened to serve groups of villages and teachers appointed to help the older people learn reading and writing outside school. There is some progress, but not as much as the villagers need, especially since more young people in villages now wish to be educated.

From village to city

Many youngsters in villages wish to take up higher studies after they finish schooling, and many more no longer wish to live in the village, but seek employment in cities. The city thus finds its supply of workers called 'manpower' from among the more ambitious villagers. Many of the cities have many more people from villages and small towns than the number for which employment is available. This leads to overcrowding in the cities and many of these 'immigrants' live in unsanitary homes or even on the pavement. The villages also lose many of their educated and able young people to the cities.

Some immigrants to cities live on the pavement.

However, as government and private firms gradually spread out their industrial units into rural areas, this heavy concentration in the cities can be eased. Also, the villagers will have the benefits of better housing and medical care, better schooling conditions and more jobs in their own area. This spreading out, called 'decentralisation', is now increasing.

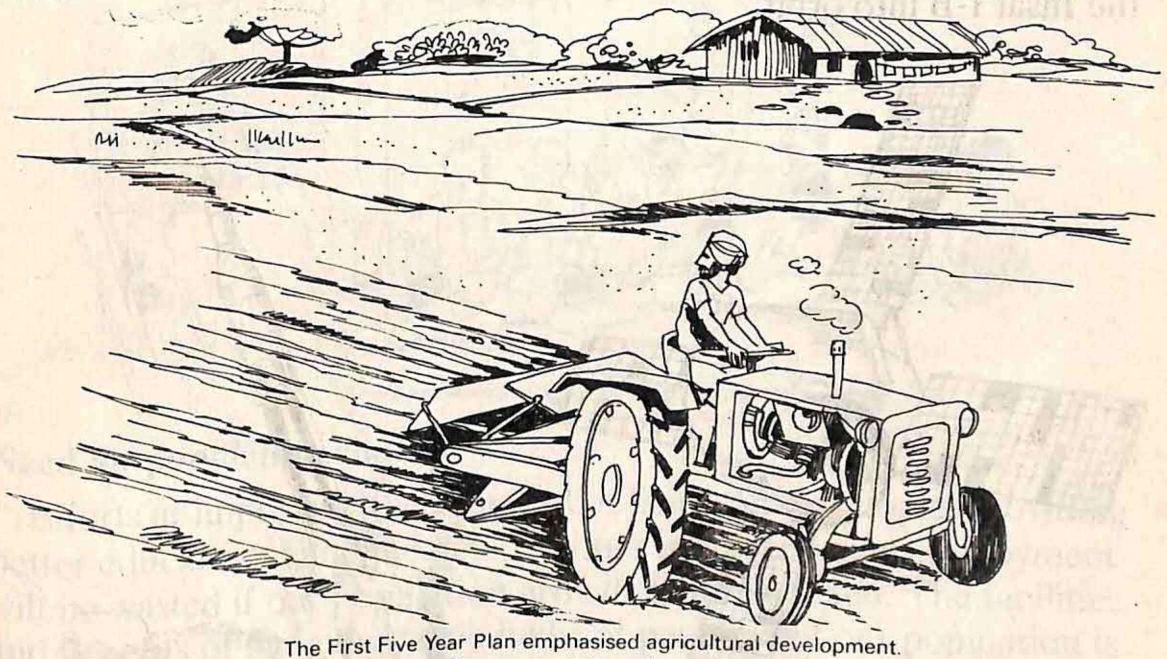


Industrial units in rural areas can benefit the villagers.

PLANNED CHANGES

After we achieved independence, the union government decided to set up a body to plan and streamline the progress and development of our country. In March, 1950, the Planning Commission was set up and entrusted with this job. The rapid pace of development and progress in many fields is the result of deliberate planning put into action by the Planning Commission, through what are called Five Year Plans.

We have had six such plans and are in the midst of the Sixth Five Year Plan. The Commission, after carefully studying our potential resources, its distribution, industrial development in different regions and many other such factors, plans the developmental activities in such a way as to maximise national development. For example, the First Five Year Plan laid emphasis on agricultural development (irrigation, power and transport) so as to provide a base for rapid industrial development. The Second Five Year Plan laid stress on heavy industries and it was during this plan period that our country took a big leap forward in industrial development.

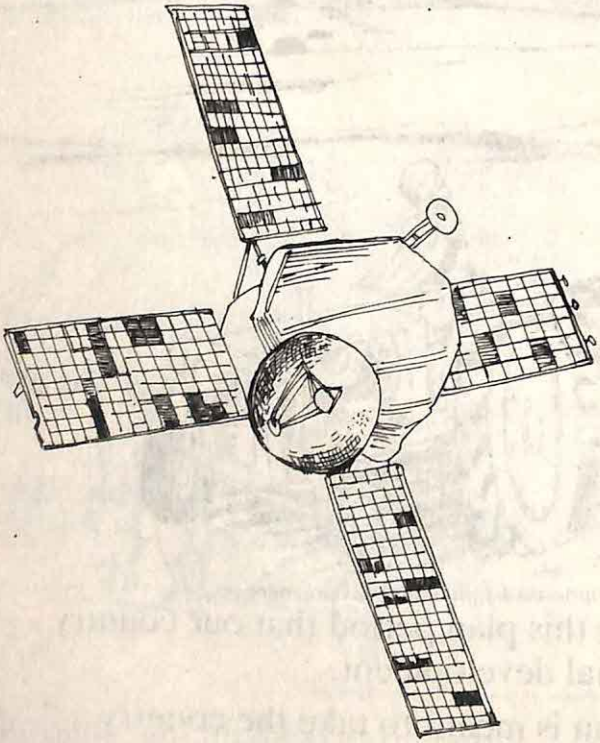


The First Five Year Plan emphasised agricultural development.

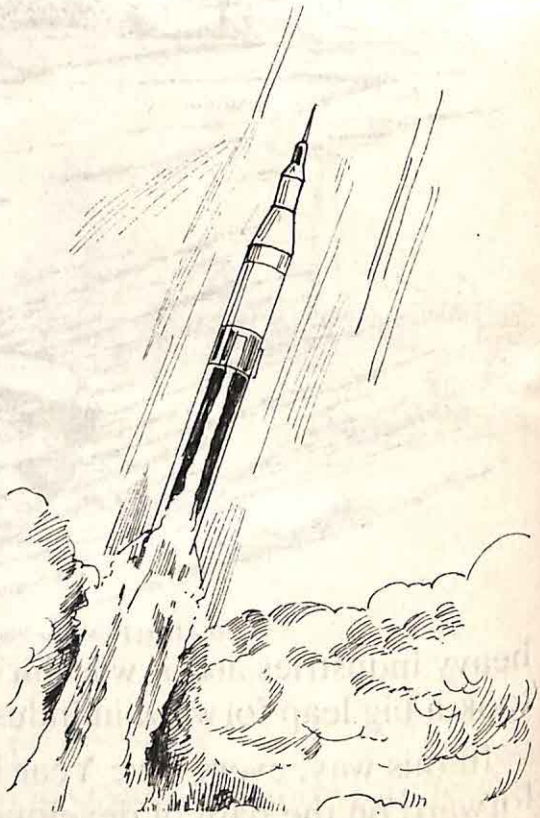
In this way, every Five Year Plan is meant to take the country forward on the path of development according to its needs and requirements.

Benefits of planning

With the implementation of the Five Year Plans, various parts of the country have benefitted from the construction of multipurpose projects for irrigation and electricity generation, setting up of hospitals, colleges, banks and heavy and light industries. Also, new farming methods and agricultural research were introduced and seed farms and fertilizer factories established. The aim of the Five Year Plans is to lay the foundation for India's prosperity and the health, education and employment of its citizens. It is like laying the foundation of many houses – agriculture, education, engineering, banking, medicine – so that each structure may in time rise to a good height and be able to make use of the knowledge and technology available in the late twentieth century. We have also taken up space technology, having a rocket centre at Sriharikota (Andhra). With Soviet, European and American assistance, we have put satellites like the Insat I-B into orbit.

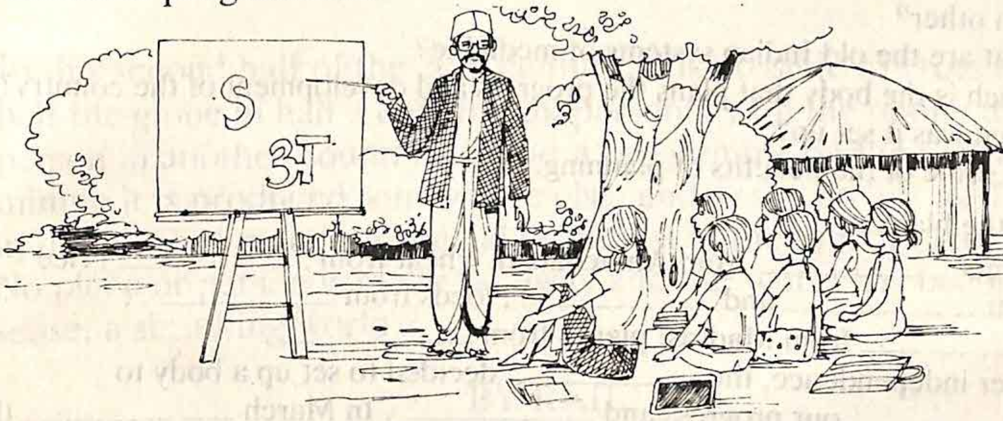


A satellite in space

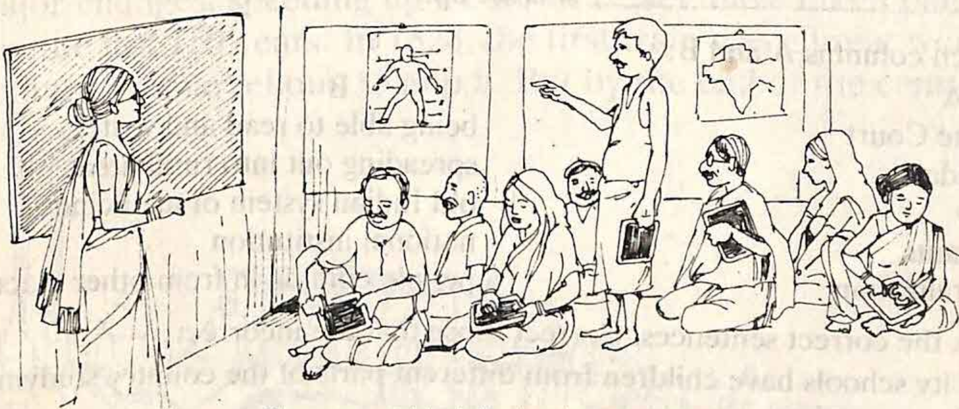


We have a rocket centre at Sriharikota.

A major goal of planning is to improve education. Primary and high schools have been opened all over the country. Older men and women who cannot read or write are taught through special adult education programmes.



A major goal of planning is to improve education.



There are special adult education programmes.

Need for population control

Efforts at improving the standard of living of the people, providing better educational and medical facilities and increasing employment will be wasted if our population growth is not checked. The facilities and benefits of planning reach lakhs of people, but our population is many times this number. The Government of India has, for several years, been promoting the family planning programme but our population is still increasing at a great rate. It would be easier for a smaller population to share the benefits of agricultural and scientific advancement and to benefit from services like education, health and training set up under the Five Year Plans.

Exercises

1. Answer briefly:
   a. What are the services that we all share?
   b. How does the movement of people in the country help us to understand each other?
   c. What are the old Indian systems of medicine?
   d. Which is the body that plans the progress and development of the country? When was it set up?
   e. List some of the benefits of planning.

2. Fill in the blanks:
   a. We get __________ from Ahmedabad, wheat from __________, rice from __________ and __________, locos from __________; __________ from Madras; planes from __________.
   b. After independence, the __________ decided to set up a body to __________ our progress and __________. In March __________, the __________ __________ was set up.

3. Match columns A and B:

A	B
Supreme Court	being able to read and write
Ayurveda	spreading out into rural areas
literacy	old Indian system of medicine
immigrants	national institution
decentralization	people coming in from other places

4. Tick the correct sentences. Correct those that are incorrect:
   a. City schools have children from different parts of the country studying in the same class.
   b. Every Indian village has a hospital.
   c. India's goal of 100 per cent literacy will be achieved next year.
   d. Many cities have more immigrants from the villages than the number for which employment is available.
   e. The Planning Commission was set up to control the Family Planning Programme.

Project work

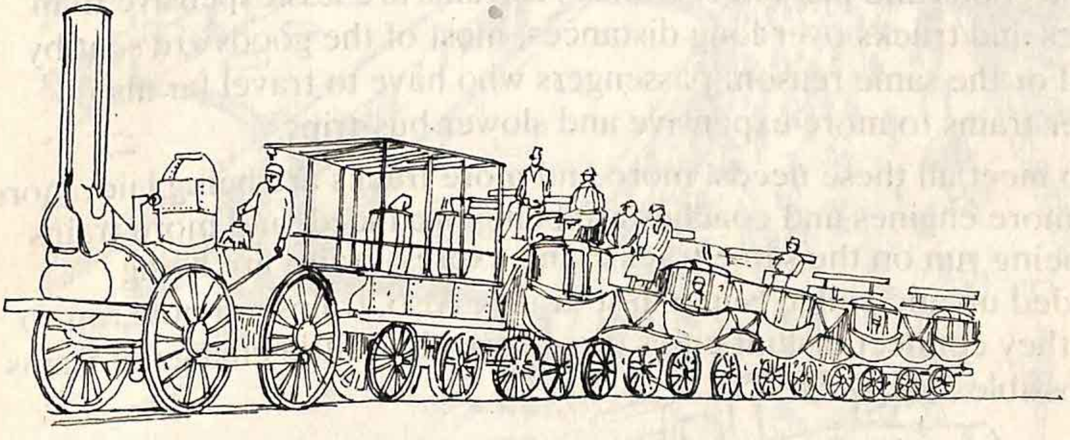
Make a chart on cooperation for progress. Draw or cut out and paste up pictures of some of our common institutions; goods manufactured in different parts of the country; children of different religions and communities studying and playing together; doctors and village workers, teachers and farmers, at work; some of the irrigation projects and industries set up under the Five Year Plan.

10. From place to place

In this second half of the 20th century, it is possible to cross by air half the globe in half a day, to talk personally on the phone to a person in another country, to hear a programme on the radio, the minute it is produced somewhere else, and to see on TV as if present at the place, a match or special event just at the time it takes place. No place or person is really far away and our world has become, in a sense, a shrinking world.

BY RAIL

Major changes, speeding up means of travel, have taken place within the last 150 years. In 1828, the first train was a great wonder, travelling at a marvellous 15 m.p.h. But by the end of the century powerful engines were pulling long caravans of coaches across the U.S.A. and Canada and across the countries of Europe, Africa and Asia. Among the long and well-known railroads of the world are the Canadian Pacific, from coast to coast, the Union Pacific in the U.S.A. and the Trans-Siberian Railway from Moscow to Vladivostok, which is the life-line of inland Russia. Special trains cross mountains through tunnels, as between Pune and Bombay in the Western Ghats, or the



One of the early trains

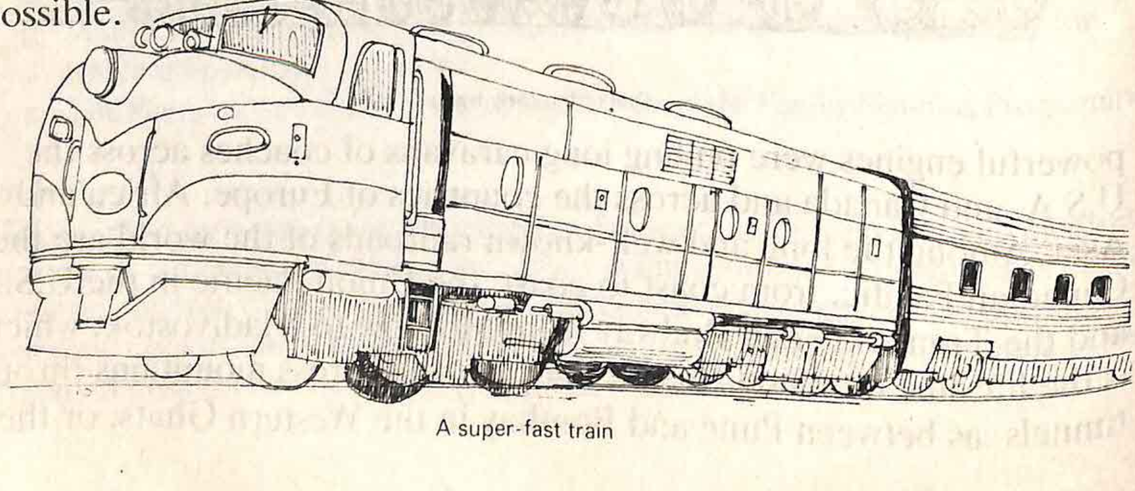
Mont Cenis tunnel in the European Alps. Some trains cross and recross rising valleys to reach hill stations like Ooty and Siliguri. Some follow the curve of the mountain range as along the Alpine Simplon pass or the Kickaway Horse pass in the Rockies. One of the densest railway networks of the world is seen criss-crossing the Indian subcontinent, rivalling the networks to be seen in the industrial areas of Europe. Carrying goods in large quantities and people in great numbers, railways have become the common man's best means of long distance travel.

A crowded railway map

The railway map of India looks crowded and, if you compare it with similar maps of many countries in Africa, Asia or even Europe, you will see what a lot of railways we have. You may find it interesting to find out which would be the shortest route between two places, and also, which would be the longest.

The Railway Ministry, through a Railway Board, is in charge of 11,000 goods and passenger trains. As trains are less expensive than lorries and trucks over long distances, most of the goods are sent by rail. For the same reason, passengers who have to travel far also prefer trains to more expensive and slower bus-trips.

To meet all these needs, more and more tracks are being laid; more and more engines and coaches are being produced, and more trains are being run on the same tracks; and express trains are being speeded up and called 'super-fast' trains. Also, trains are now run so that they connect distant cities directly, with as little change of trains as possible.

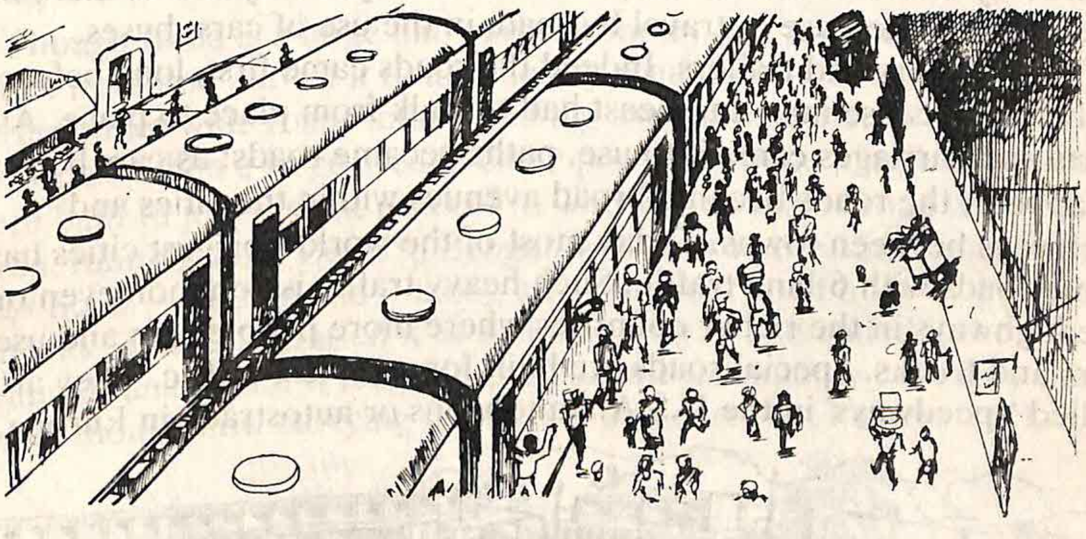


A super-fast train

Express, passenger, mail and goods

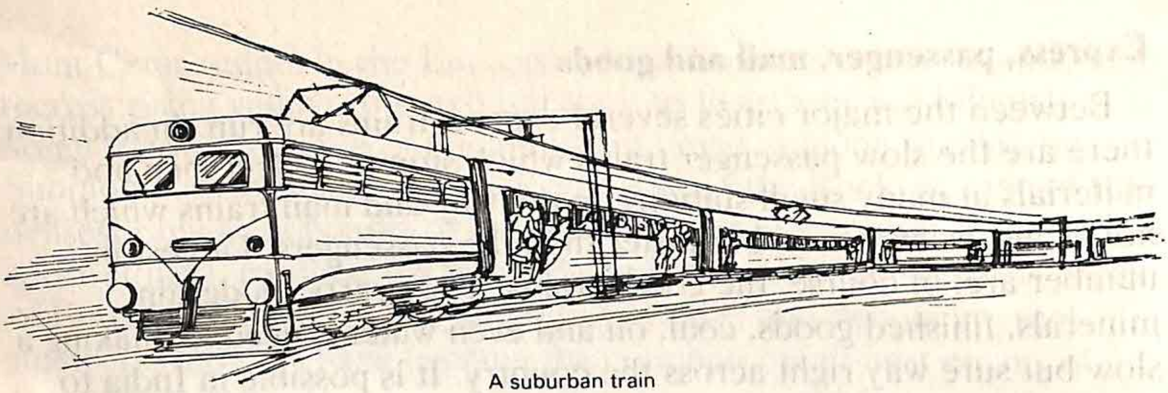
Between the major cities several express trains are run. In addition there are the slow passenger trains which stop to collect men and materials at many small stations on the way and mail trains which are not as fast as expresses but faster than the passengers. Largest in number are, of course, the goods trains. They carry foodgrain, minerals, finished goods, coal, oil and even water if needed, making a slow but sure way right across the country. It is possible in India to send goods by rail from anywhere to anywhere. If there are no rail tracks in certain areas, the Railways themselves arrange for onward transport of goods and people, by road in hilly areas, by ferry, across rivers and by steamer along the coast.

Specially interesting railways are built on the hillsides. A small train with special tracks takes one through beautiful scenery, from Mettupalayam at the foot of the Nilgiris to Ooty at the top. The train between Pune and Bombay goes through 22 tunnels, right through the Western Ghats. Another mountain train goes from Calcutta to Siliguri, for people on the way to Darjeeling and Kalimpong.


A busy railway station

Suburban trains

Bombay, Madras and Calcutta also have suburban train services to reduce pressure on city buses. In Bombay there are two main

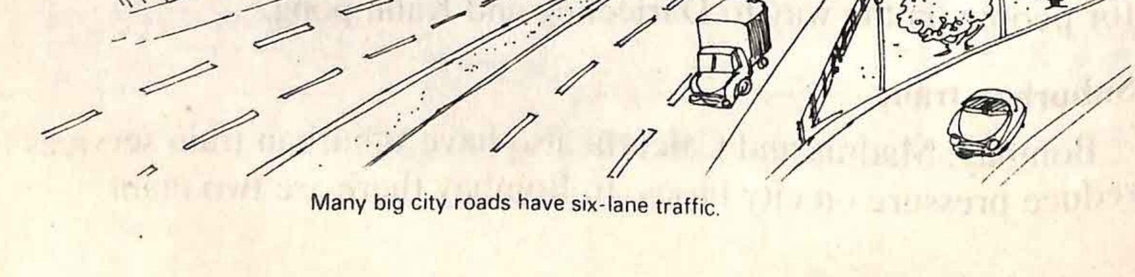


A suburban train

suburban routes, 80 km long, plus one line especially to take men and goods to the busy harbour area. In Calcutta the suburban services extend upto Kharagpur and in Madras upto Arakonam, 75 km away. There are plans to extend the services in both Madras and Calcutta.

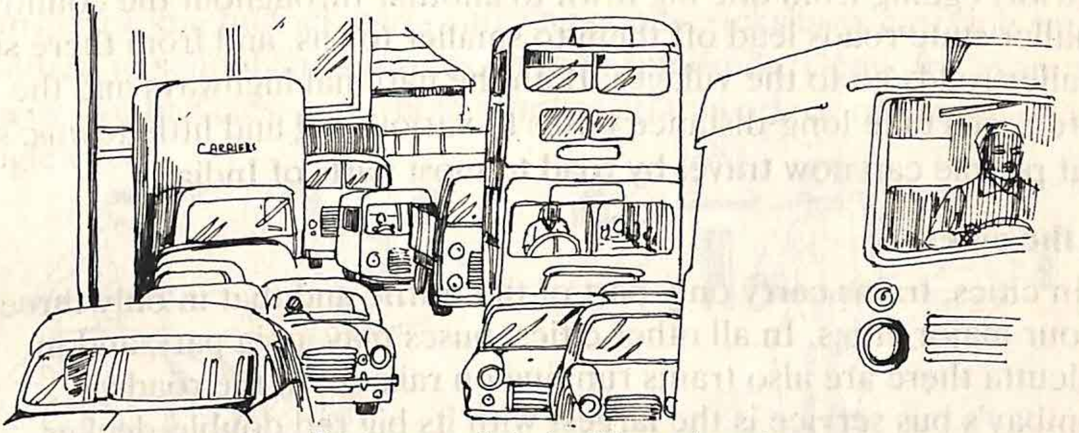
ON THE ROAD

Side by side with the development of railways everywhere, there has been a great increase in travel by road, in the use of cars, buses, lorries, tractors and trailers. Indeed the roads came first, long before railways, because man and beast had to walk from place to place. As carts and carriages came into use, paths became roads; as cars began to appear, the roads became broad avenues within the cities and highways between towns. Today most of the world's biggest cities have some roads with 6-lane traffic. Such heavy traffic is common even on the highways in the richer countries where more people own and use cars and trucks. Special roads are built for such fast traffic. They are called 'speedways' in the U.S.A., autobahns or autostrada in Europe,



Many big city roads have six-lane traffic.

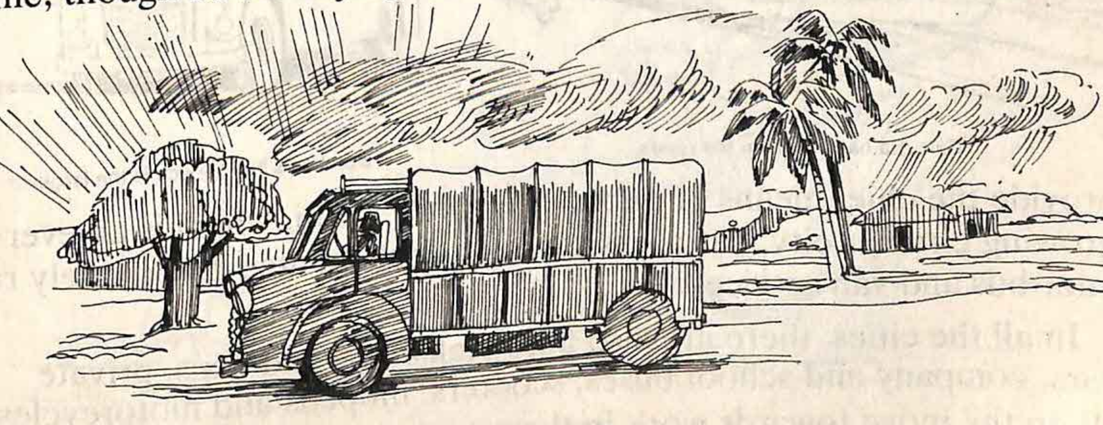
highways in the U.K. Travelling at such speed certainly brings one's destination nearer in terms of time. Not only cars of various kinds, but trucks, touring buses, double-decker buses, truck and trailer caravans, oil trucks, are all common sights on city roads and highways.



There are many kinds of vehicles on city roads.

Long-distance travel

Though India is a large and varied country it is not difficult to travel from one part of it to another by road. Even in the empires of earlier times wide roads linked one big town to another within each kingdom. When a large area became part of a single kingdom, roads were built to join distant parts of it. The largest major road in North India, running from Delhi to Bengal, was built in the 15th century by Sher Shah — and he laid it along an even older road built by Feroz Tughlak. The British used it as a main highway and called it the Grand Trunk Road. It is still in use and still commonly called by that name, though now carrying not horses and carts but lorries, trucks



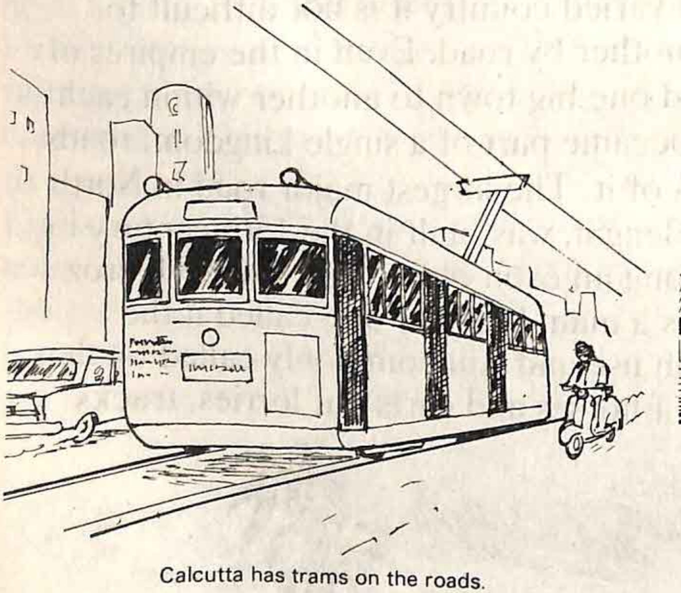
Lorries carry goods over long distances.

and trailers. Regular buses for passengers and goods have made road travel safe, speedy and popular.

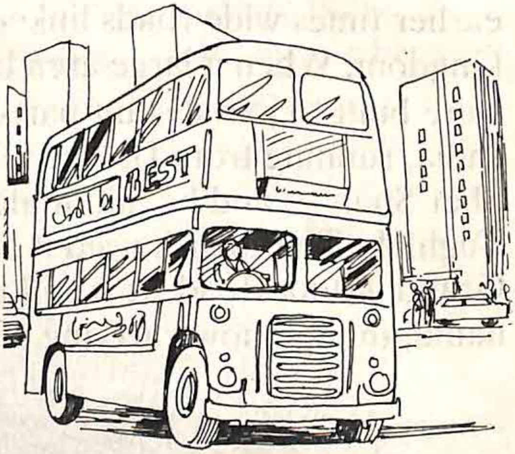
All of India is today linked by broad major roads called national highways going from one big town to another throughout the country. Smaller state roads lead off them to smaller towns, and from there still smaller roads go to the villages. Both the national highways and the state roads take long-distance buses to various big and little towns, so that people can now travel by road to most parts of India.

In the cities

In cities, trains carry only part of the traffic and that in only three of our major cities. In all other cities, buses play a big part, and in Calcutta there are also trams running on rails set in the roadway. Bombay's bus service is the largest with its big red double-decker buses carrying lakhs of people over distances of upto 25 km to work and back within this long narrow island city. In Madras also, the buses provide the chief means of public transport. Delhi, which is an ever-growing circular city, has a bus service supplemented by privately run mini-bus and van services.



Calcutta has trams on the roads.



Bombay's bus service is the largest.

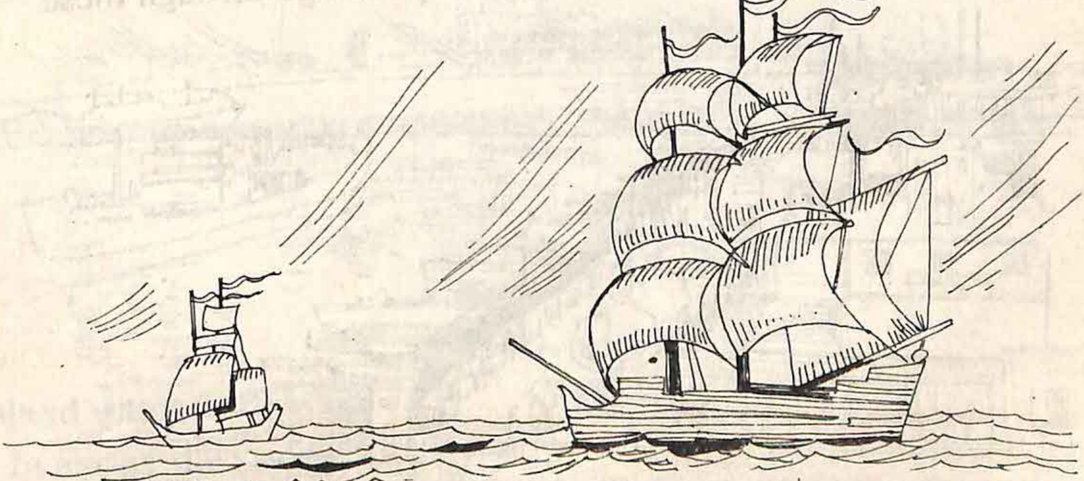
In all the cities, there are also auto-rickshaws and taxis, private cars, company and school buses, scooters, mopeds and motorcycles, all on the move towards work in the morning and forming a returning tide of people and machines in the evening. At night, there are lorries thundering through carrying fruit, vegetables and goods to the large markets.

With all this modern fast transport one still sees slower forms of transport too – bullock carts carrying goods, rickshaws carrying small children to school and bicycles, in their hundreds. Delhi, for example, is a city of bicycles, and whole families go to work or on picnic on a single cycle.

There are also slower vehicles like rickshaws and bicycles.

AT SEA

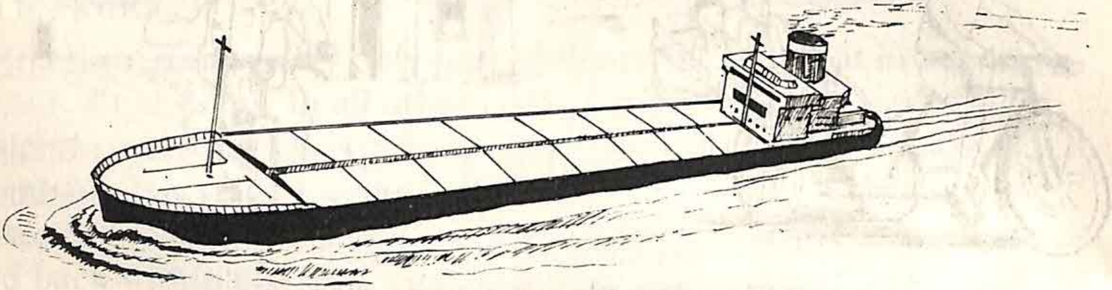
Almost as old as walking is the art of sailing. The first round primitive boats were used on lakes and rivers, over short distances. Narrow, pointed boats could sail further out, and one can still see such boats anywhere on the coasts of India and Sri Lanka. Later, sailing ships with tall masts and many sails made 'fast' passages from country to country and even around the world. The fastest of these



Sailing ships

ships seemed slow when steamships came into use, less than a century ago. Today's slowest ships are faster than the first steamships and passenger liners like the "United States" can cross the Atlantic in three days.

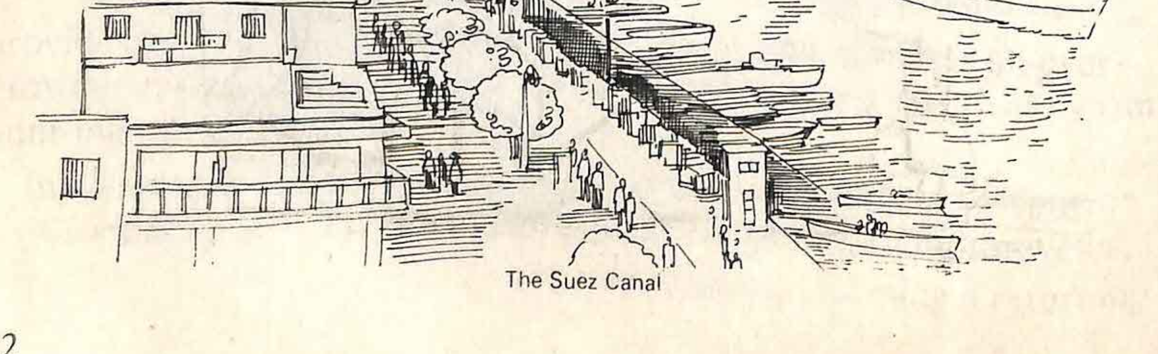
Cargo ships are slower and smaller than passenger liners but even they are now very big (1,00,000 tons being common) and very quick, because the fast ships get the most valuable cargo. Huge oil carriers with flat tops and funnels at one end, cross from continent to continent, as also large container-cargo ships.



An oil tanker

The Suez and Panama Canals

To shorten the sea routes, canals have been cut between continents. The Suez Canal links the Mediterranean and the Red Sea. The Panama Canal neatly slices South America from the curving Isthmus of Central America to provide passage between the Pacific and Atlantic Oceans. All but the largest ships can go through these

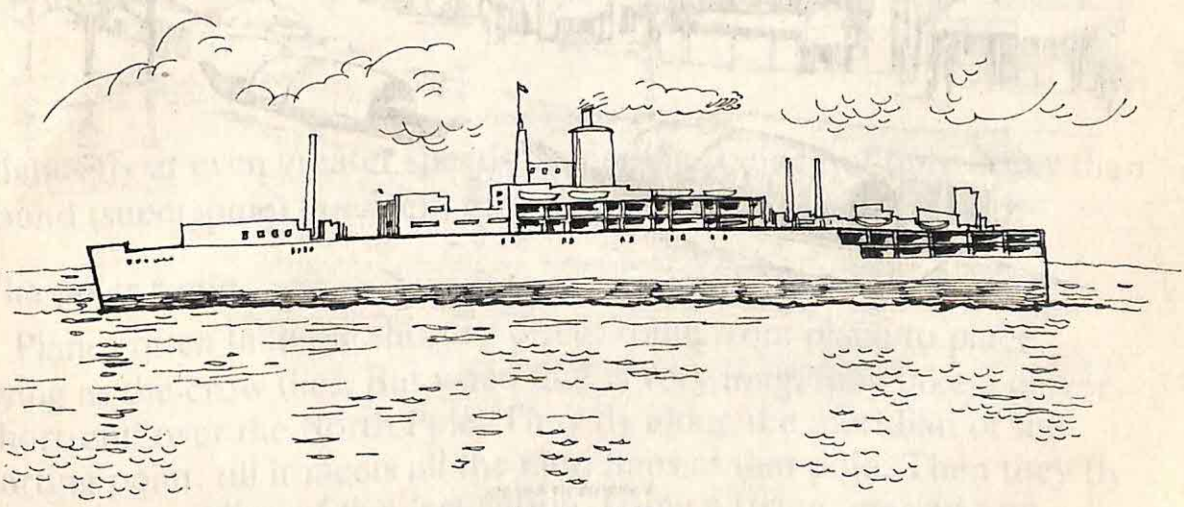


The Suez Canal

canals, and only the largest need to go round the Cape of Good Hope at the tip of Africa. As to stormy, dangerous Cape Horn at the tip of South America, no lives need be risked there after the Panama Canal was constructed.

Coastal and overseas shipping

In India, ships are used for travel and transport not only to other countries, but also from one place in India to another. Cargo and people are carried up and down the coast by sea. Ships that go to ports along the coast (such as Bhatkal or Ratnagiri) need not be very large (a 6000 ton ship is considered very small) and can enter small harbours like those on the west coast or Tuticorin on the east coast.. Ships that take cargo and people across the oceans have to be large. We have such 'foreign going' ships from 10,000 tons to over one lakh tons in weight and carrying capacity. There are different kinds of ships — cargo ships, cargo-cum-passenger liners, oil tankers, and bulk carriers. They use our larger seaports like Bombay, Calcutta, Madras, Vishakhapatnam, Kandla and Cochin where goods are received and sent to inland areas.



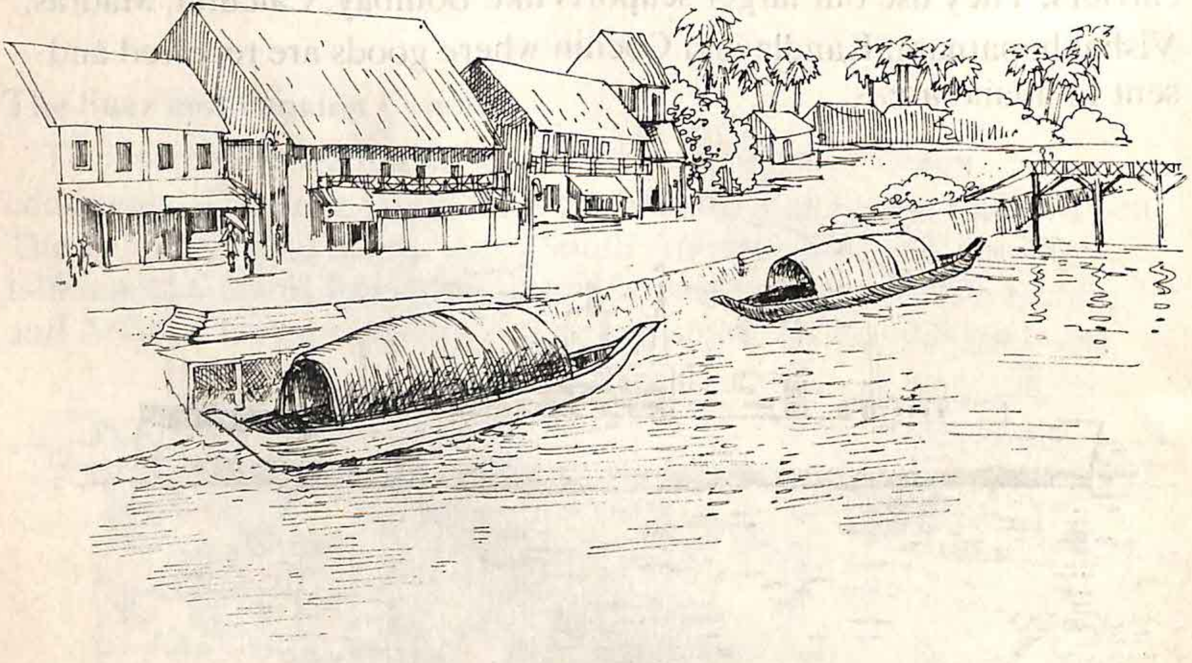
An ocean liner

Inland water traffic

In earlier days a few canals carried cargo and people between large lakes or rivers. Today canals are used more for irrigating crops than for boats, because now there are major roads and railways almost everywhere.

The two exceptions are West Bengal and Kerala. West Bengal has so many small rivers without bridges, each passing so many villages and little towns that water-traffic has always been necessary. Boats and ferries ply up and down these rivers and across them. Old type country boats are in use, as also larger, faster steam launches which can make their way against the current of these fast flowing streams, which finally join the Ganga.

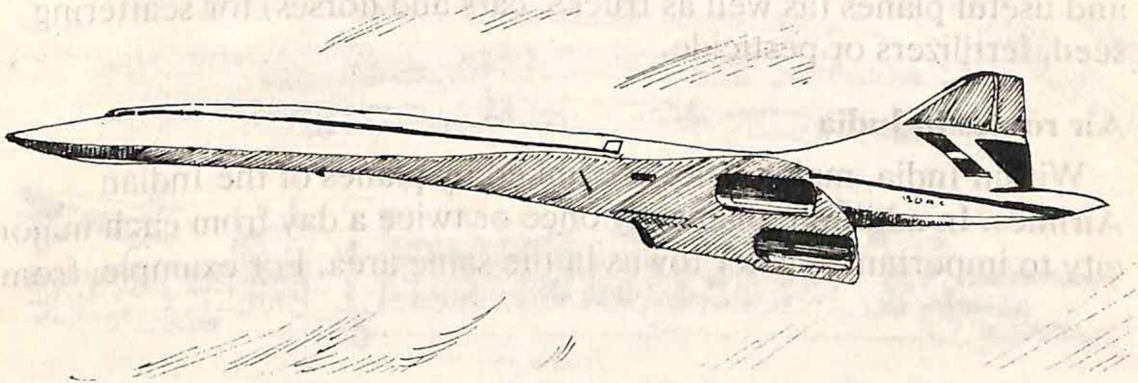
In Kerala, the sea comes in at many places and forms broad lake-like lagoons. The river mouths are also wide deep estuaries (not shallow deltas as on the east coast). Villages and towns in Kerala are always near water — lakes, streams, rivers, lagoons or village tanks. Boats are used to transport people, grain, fruit, animals and fish. Made of coconut wood and matting, the partially-roofed boat called the 'vallam' is typical of Kerala even today. In addition, motor launches are very much in use also. In both the states there is an abundance of water and villagers are skilled from a very early age in swimming and handling boats. Many of their folk songs and their festivals concern activities and skills related to water.



Vallams in Kerala

IN THE AIR

But the real wonder of fast transport came after 1945. Till the 1930s planes were still considered quite unsafe and used mostly for military purposes. After 1945, they suddenly became the best way to travel. The first passenger planes were small, with 25 to 40 or 50 passengers. They could rise quickly off the ground and didn't need long runways. But soon the Douglas DC 4 (the hardy 'Dakota') gave place to Vikings, Viscounts, Comets, Boeings, Tri-stars and the Airbus. The larger planes carry nearly 300 passengers on each trip, race down long runways and trace a long path into the sky to gain height. They fly at over 10,000 m above the ground at speeds of over 600 km per hour. The fastest civilian plane, the Anglo-French Concorde, flies at over 2000 km per hour, which is faster than the speed of sound. Military planes fly at even greater speeds, sometimes being not only faster than sound (supersonic) but even, for a while, twice as fast as sound.

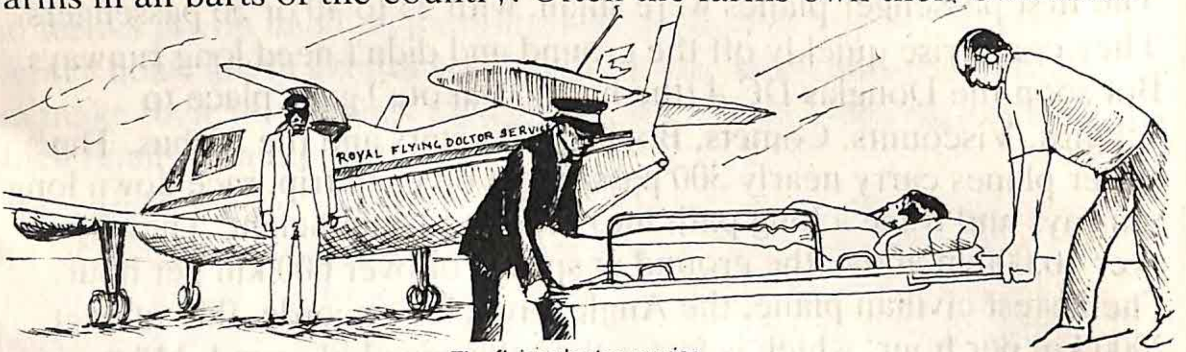


The Concorde

The polar route

Planes often take the shortest direct route from place to place, flying as the crow flies. But when that is very long, they take a clever 'short-cut' over the North Pole. They fly along the meridian of the starting point, till it meets all the meridians at that pole. Then they fly along the meridian of the destination. Using a string, measure on a globe the three possible routes from Copenhagen (Denmark) to Anchorage (Alaska) – 1. across the Atlantic and North America; 2. across Europe and Russia; 3. the polar route. You will be able to see which is the shortest.

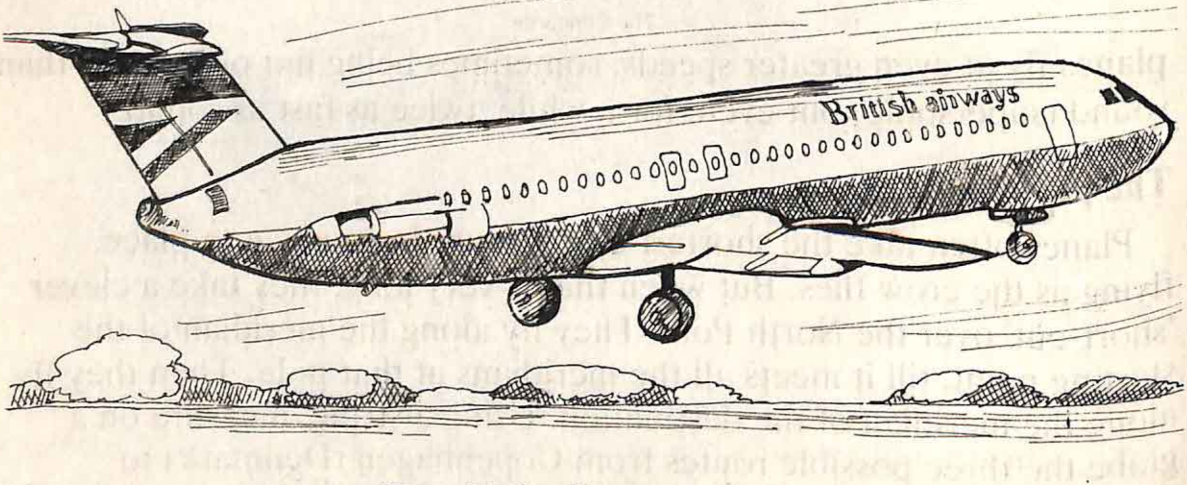
There are streamlined passenger planes and also large full-bodied cargo and troop transport planes. Then the small and easily manageable planes are very useful in countries without much railway. In Australia a Flying Doctor Service using such planes helps far off farms in all parts of the country. Often the farms own their own small and useful planes (as well as trucks, cars and horses) for scattering seed, fertilizers or pesticide.



The flying doctor service

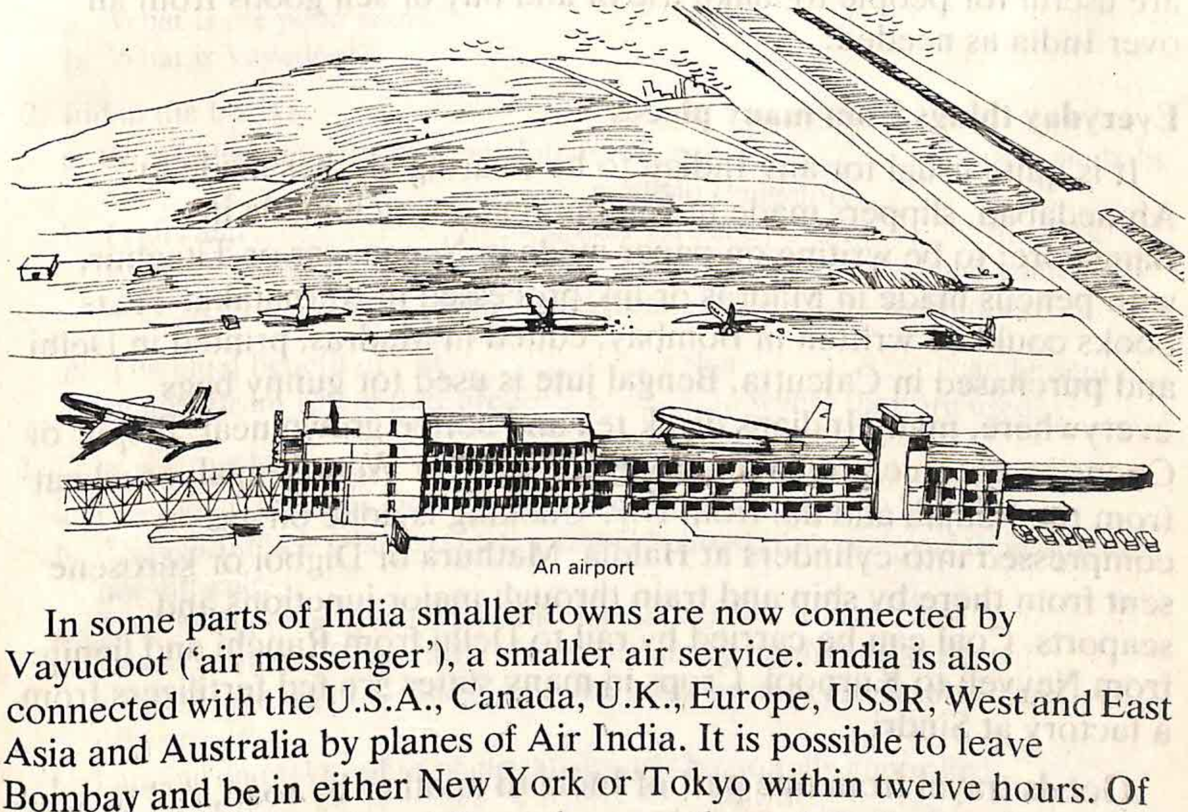
Air routes in India

Within India, major cities are linked by planes of the Indian Airlines. In addition, planes fly once or twice a day from each major city to important smaller towns in the same area. For example, from Bombay, one can go to Ahmedabad, Pune or Bhavnagiri; from Delhi to Agra, Kanpur, Patna, Jaipur, Srinagar; from Calcutta to Bagdogra



Planes of foreign airlines also fly through India.

(for the hills), Gauhati, Jamshedpur, Cuttack; from Madras to Madurai, Tiruchi, Coimbatore, Bangalore, Trivandrum, Cochin. These are only a few examples and any of the four major cities in India and quite a few of the other large ones – Nagpur, Bangalore, Hyderabad, Ahmedabad – are themselves like aeroplane cross-roads. Of course all air traffic is carefully controlled and no two planes are allowed to take off or land at the same time or fly at the same height or direction near an airport, to avoid risk of collision. In this, air traffic is far better controlled than road traffic in any city.



An airport

In some parts of India smaller towns are now connected by Vayudoot ('air messenger'), a smaller air service. India is also connected with the U.S.A., Canada, U.K., Europe, USSR, West and East Asia and Australia by planes of Air India. It is possible to leave Bombay and be in either New York or Tokyo within twelve hours. Of course planes of foreign airlines also pass through India but the Indian planes and trains are all owned by the Government of India.

TRANSPORT FOR TRADE

The chief benefit of fast transport – lorries, trains, ships, planes – is that goods can be sent quickly from where they are produced to where they are used. Wheat can be sent by train from Punjab to Bombay and Madras or by sea from Australia to a suitable port like

Calcutta or Madras and then on by lorry or train. Ores travel in railway wagons from mines to seaports like Vizag and are sent abroad from there. Coal comes by train from Singareni in Bihar to Ennore in Tamil Nadu. Oil from Bombay High, Ankleshwar or Haldia reaches Uran, Kandla or Calcutta by pipe line, is taken by special ships (oil tankers) to other ports like Tuticorin and there loaded on to special trucks to go by road or rail to inland towns everywhere.

Good roads, miles of railway lines, many seaports and fast planes are useful for people to make use of and buy or sell goods from all over India as needed.

Everyday things from many places

It is quite usual for any Indian to be wearing clothes made in Ahmedabad, slippers made in Kanpur and a watch made in Bangalore; to be writing on paper made in Nepanagar or Titaghur, with pencils made in Madras or ink processed in Karnataka. Textbooks could be written in Bombay, edited in Madras, printed in Delhi and purchased in Calcutta. Bengal jute is used for gunny bags everywhere, many Indians drink tea and coffee grown near Tezpur or Coonoor, eat rice grown in a southern state or West Bengal, or wheat from the Punjab and dal from U.P. Cooking is done on gas compressed into cylinders at Haldia, Mathura or Digboi or kerosene sent from there by ship and train through major junctions and seaports. Coal can be carried by rail to Delhi from Ranchi and lignite from Neyveli to Kurnool. Crops in many states are fed fertilizers from a factory at Sindri.

Goods travel from one part of India to another by road, rail or sea. Industries are usually set up close to where iron and steel are available like Ranchi or Dhanbad, Jamshedpur or Bhadravati. But their products are used all over India. Whatever food or cash crops we grow, are grown for use both nearby and much further off. Fruits and vegetables too are now taken fresh by road and rail from village to small towns to larger towns and flown from there to cities. Even flowers, in season, like roses and jasmine, come daily from Srinagar to Delhi or Madurai to Madras.

Exercises

1. Answer briefly:
    a. Name two of the longest and most well-known rail routes in the world. Which countries do they cross?
    b. Which country has one of the densest railway networks in the world?
    c. What are the four different kinds of trains? Which is the fastest?
    d. What is the history of the most important highway in North India?
    e. What are the different kinds of transport commonly seen in a city?
    f. Which are the man-made canals which have shortened two important sea routes?
    g. What is the polar route?
    h. What is Vayudoot?
2. Fill in the blanks:
    a. Any Indian may be wearing clothes made in __________ slippers made in __________ and a __________ made in Bangalore.
    b. Fruits and __________ are now taken fresh by __________ to cities. Even __________ , in season, like __________ and jasmine, come daily to __________ from Srinagar and from __________ to Madras.
    c. The chief benefit of fast __________ is that __________ can be sent quickly from where they are __________ to where they are used.
3. Give reasons for:
    a. Over long distances, goods are sent by rail rather than by road.
    b. Though India is a large country, travel by road from one part to another is not difficult.
    c. Coastal shipping usually consists of small ships.
    d. Inland boat and ferry traffic is common in Kerala and West Bengal.
    e. From Copenhagen to Anchorage, the polar route is preferable to any other route.
    f. Landing and take-off of planes at airports is carefully controlled.
4. Match columns A and B:

A	B
Trans-Siberian Railway	German highways
Suez Canal	Supersonic
autobahns	across Russia
22 tunnels	Delhi to Bengal
Concorde	Mediterranean to Red Sea
goods trains	Bombay to Pune
Grand Trunk Road	most numerous

Project work

1. With the help of a railway map and a road map of India trace out the best possible rail and road routes from the place where you live to the four major cities of India. If you live in a city with an airport, find out the air routes also.

2. Make clay models of
   - a. An airport
   - b. River boats
   - c. A goods train

11. How information travels

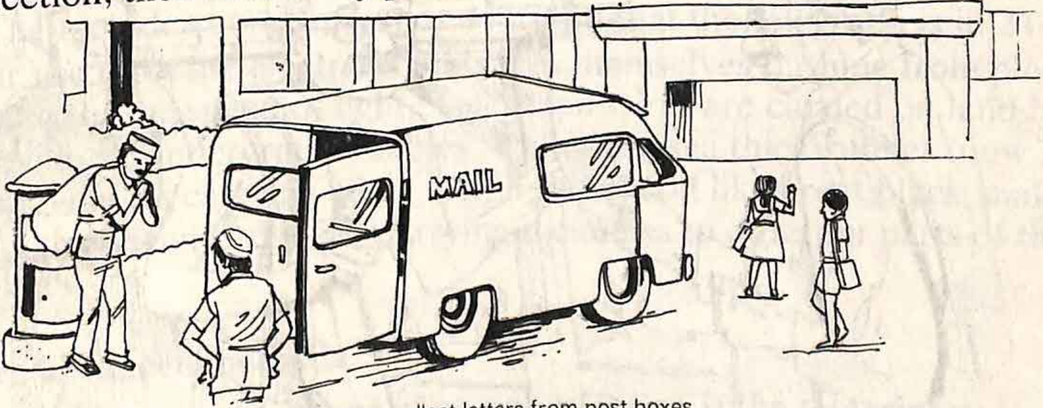
It is not only people and things which have to move. Information also has to go from place to place, often very urgently. This job is done by the Post and Telegraph Department, the telephones, radio and television.

THE DAILY POST

Millions of letters are sent each day from person to person. They are all delivered at the very door of the recipient, in a very short time and at a very small cost, if you consider the distances involved. The present postal system is about 150 years old. It has worked so well that the method of sorting post and delivering it has remained unchanged in spite of the enormous increase in the number of letters written.

How letters travel

Letters first go into post boxes painted the typical bright red now called 'post-box red'. Postmen collect them at stated times, and they are rubber stamped at the nearby post office to show the time of collection, then sent on by postal van to the area's central post office and from there to the railway station or airport according to the destination and value of stamps affixed. Before planes came into common use, overseas post was sent by fast cargo or passenger liners. Today ships carry mail only where there are no train or air services—to small islands or to places along a river deep within Africa, South America or Asia.



Postmen collect letters from post boxes.

When a British-type postal system was first set up in India, men used to literally run with the 'dak' from town to town and to the villages. Their resting places are even now called 'dak' bungalows.

A dak runner

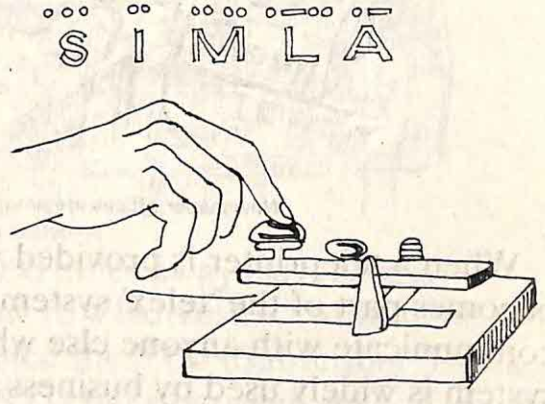
Gradually trains began to carry the post. Today a very efficient system uses trains, planes and vans to carry mail all over the country and abroad. Villagers receive their post by bus or postal vans. Letters are delivered to the addressee no matter how small, or distant from a town, his village is.

A letter is delivered.

THE TELEGRAPH, TELEPRINTER AND TELEX

When the telegraph was first thought of by Samuel Morse, he used a combination of fact and idea. The fact was that man had learnt to send electricity through wires as and when he wanted. The idea was that a set of sounds was invented which could be used as a sort of electrical language. This language is called the 'Morse code' and is quite easy to learn with practice. If you go to a telegraph office and listen, you will hear a rhythmic tick-tack sound – it is the sound of the little telegraph transmitter, the Morse 'key' as it is called, sending out in Morse code messages received from the public. The Morse code itself is the English alphabet converted into dots and dashes. There is also a system of numbers.

Samuel Morse



Tapping the Morse key

The fact-idea combination is so useful that the telegraph is in 24-hour use now, the electrical messages themselves flashing from place to place at the speed of light. Telegraph wires are carried on land by tall poles or underground cables. Under the sea thick rubber (now plastic) cables carrying wires within them, coil like great black snakes along the ocean beds – all carrying messages to different parts of the world.

More advanced methods

A more advanced means of communication is the teleprinter. It works on the same principle as the telegraph but the message, instead of being tapped out in Morse code, is typed out on a keyboard (as in a typewriter). It is then converted into electrical impulses which are sent through wires and cables and reconverted into typed matter at the other end. Newspaper offices are among the leading users of teleprinters.

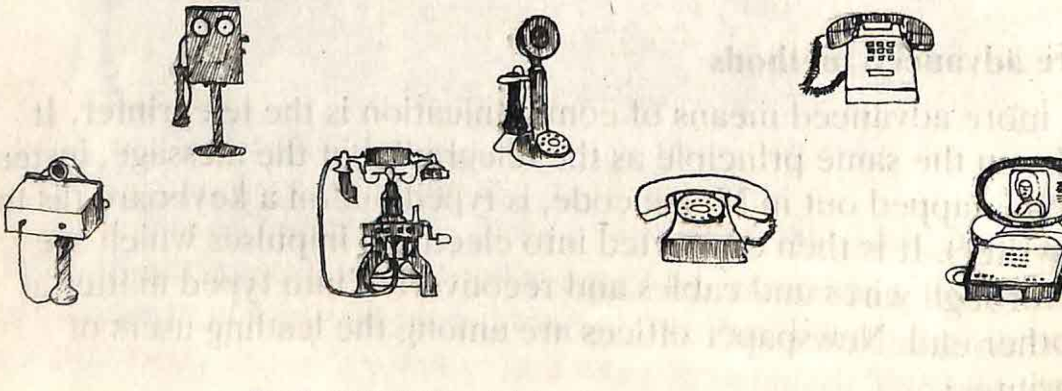
In several countries, the old telegraph system has been replaced by teleprinters. The Indian Post and Telegraph Department uses both systems for the sending of telegrams.

Newspaper offices are among the leading users of teleprinters.

When a teleprinter is provided with a dial like a telephone, it becomes part of the 'telex' system. With such a connection, one can communicate with anyone else who also has a telex connection. This system is widely used by business and government organisations.

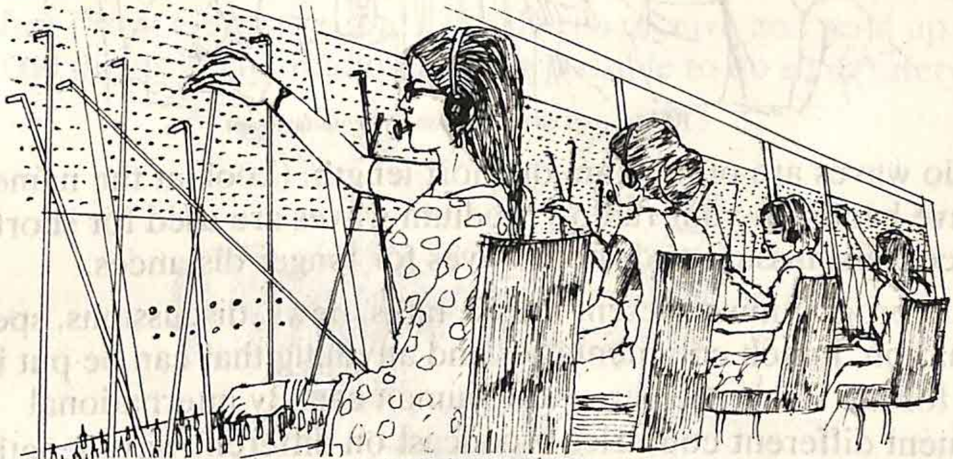
THE TELEPHONE

The telephone was invented by an American, Alexander Graham Bell. At first it was possible only to connect persons in nearby places; later, connections across the country were possible; now calls can be made across the world.



Telephones make it possible to talk to persons who are far away.

In the beginning, an operator at the telephone exchange had to connect calls even within a city. Later, automatic exchanges were set up in cities but the operator was needed to connect calls from one city to another. This is called a 'trunk' call. In some countries, it is now possible to dial direct to a person 5000 miles away (say, across Canada) or 7000 miles away (Moscow to Vladivostok) without an operator to book the call. This is called the STD (Subscriber Trunk Dialling) service. In India, we have STD links between several major cities and towns as well as with the U.K., Singapore, Hongkong and Australia. Europe, the U.S.A. and Canada have STD links with most advanced countries. So, in just the time it takes to dial about 14 digits, you can speak directly to a person 12,000 miles away.

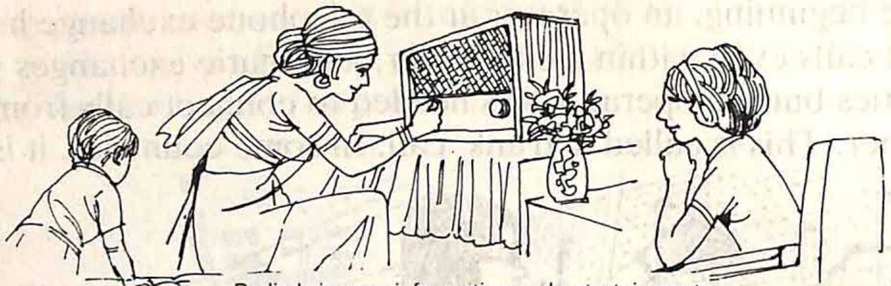


A telephone exchange

Telephone lines are usually laid underground in cities and carried overhead through poles, overland. Across the seas, they are carried by undersea cables. Sometimes international calls are clearer than local calls, because the undersea lines lie undisturbed deep down, whereas above ground, wires can be disturbed by contact with birds, trees or storms or even by the electricity around us, called static electricity.

THE RADIO

Though you need electricity to switch on the radio, the radio waves themselves need no wires to travel from place to place. Once scientists learnt to convert sound waves to electricity in a transmitter and back again to sound in a receiver, the radio was born.



Radio brings us information and entertainment.

Radio waves are of medium or short length. (Look at the names of the wave bands on your radio.) Medium waves are used for short-distance transmission and short waves for longer distances.

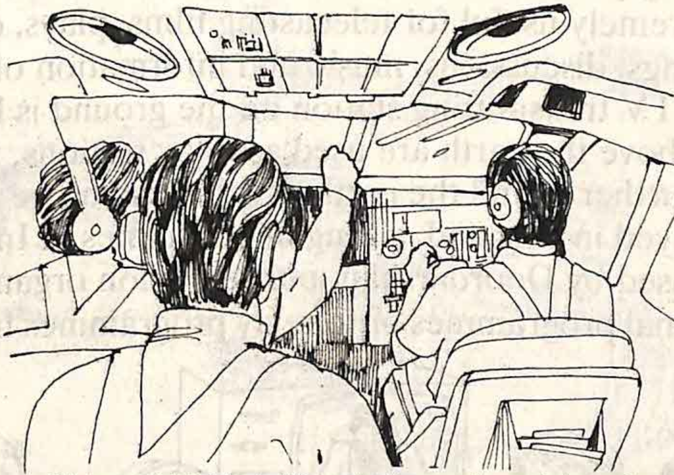
Radio programmes present music, talks, news, discussions, special information, match commentaries and anything that can be put into words for the final receiver – the human ear. By international agreement different countries broadcast on different wave lengths and different stations in a country have each a given wave length, so you know where to find the programme you want. Certain wave lengths are reserved for Morse signals only, so that any plane or ship in trouble can be sure its signal for help will be heard.

Radio for safety

The radio is of immense help to ships and planes. Since a tragedy at sea in 1912 (the 'Titanic' disaster in the North Atlantic), all ships must keep a 24-hour radio watch. This applies to planes also. Further, as

Radio is used to call for help in an emergency.

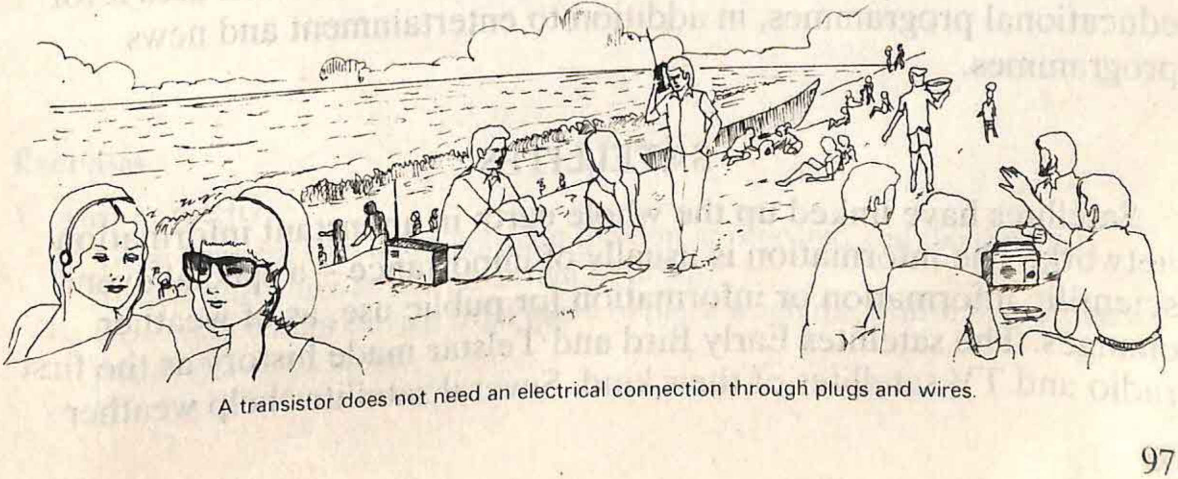
traffic at major airports increases, to prevent collisions, traffic control towers tell each plane what speed, height and direction it must maintain to ensure that it takes-off and lands safely. Large airports like Kennedy (New York), O'Hare (Chicago), Heathrow (London), Frankfurt (West Germany) and Orly (Paris) receive and send up more than 1000 flights a day. Radio makes it possible to do so in safety.



Pilots are guided by traffic control towers through the radio.

The transistor

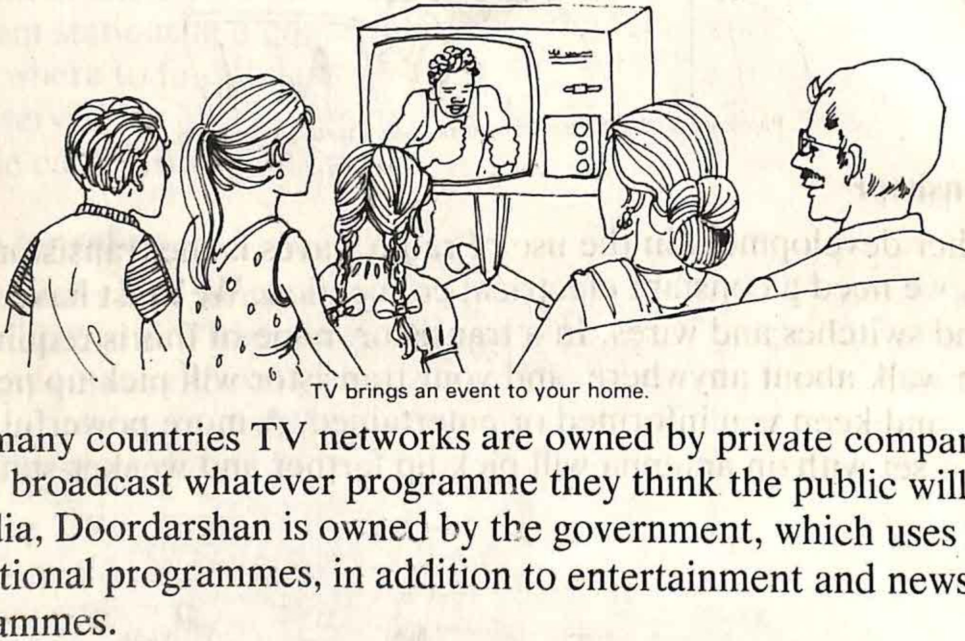
Another development in the use of radio waves is the transistor. In a radio, we need a constant electrical connection. We must have plugs and switches and wires. In a transistor, none of this is required. You can walk about anywhere, and your transistor will pick up nearby stations, and keep you informed or entertained. A more powerful transistor set with an antenna will pick up farther and weaker stations also.



A transistor does not need an electrical connection through plugs and wires.

TELEVISION

If radio is instant sound, TV is instant sight. TV transmission converts both the image and the sound into electromagnetic waves for broadcasting. They are then converted back into image and sound in the receiving set. This brings an actual event right in front of you, even if it is taking place somewhere on the other side of the globe. TV is therefore extremely useful for telecasting films, plays, dances, matches, meetings, discussions, music and information of all kinds. The range of a TV transmitting station on the ground is limited. But now satellites above the earth are used as relay stations, passing on the broadcast further round the earth. By this means we are able to see a match played in England, sitting in our homes in India. Insat I-B is the satellite used by Doordarshan, our television organisation, to broadcast national programmes or to relay programmes from overseas.

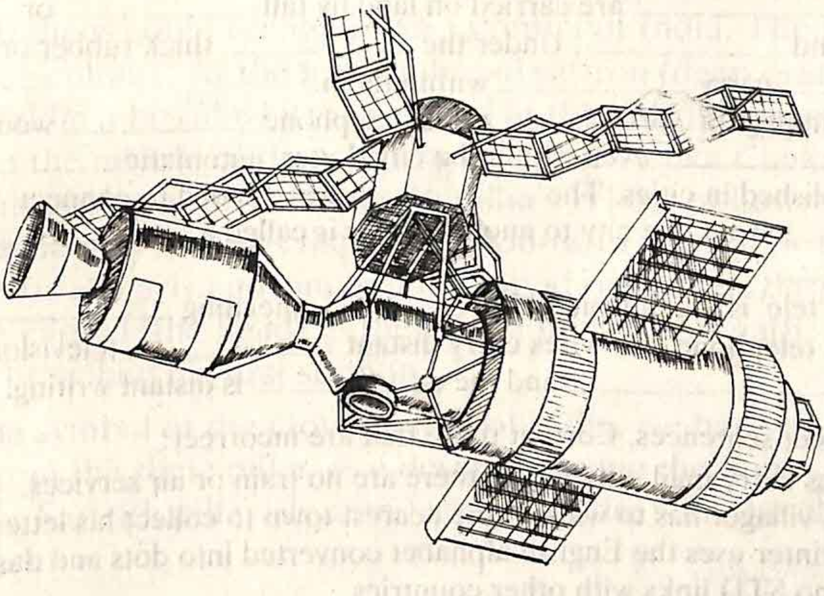


TV brings an event to your home.

In many countries TV networks are owned by private companies which broadcast whatever programme they think the public will like. In India, Doordarshan is owned by the government, which uses it for educational programmes, in addition to entertainment and news programmes.

SATELLITES

Satellites have linked up the whole earth in an instant information network. The information is usually of importance – a special event, scientific information or information for public use, as of weather changes. The satellites Early Bird and Telstar made history as the first radio and TV satellites of their kind. Several satellites help weather forecasting by sending pictures of circling storm systems and significantly changing cloud patterns. Skylab, the famous U.S. satellite, photographed most of the earth. It's pictures could tell us more in two years about the earth's geographical formations, metal ore distribution and crop growth pattern, than we could have learnt otherwise in 30 years.



Skylab

The word 'tele', in common use now, is taken from old Greek, meaning 'far'. When you telephone, the wires carry distant sound, television is distant sight and the telegraph is distant writing. These inventions literally send sound, image and writing across the world, for us to receive on our radio and TV sets, or to read in a telegraph form brought to our door.

Exercises

1. Answer briefly:
   a. What happens to a letter between the time it is posted and the time it is loaded with other letters on a train or plane?
   b. How were letters carried from place to place when the British first set up a postal system in India?
   c. What is the Morse code?

d. What is the difference between a teleprinter and a telex?
e. What is the STD service?
f. How is radio used in airports?
g. Why are satellites used in television transmission?

2. Fill in the blanks:

a. Telegraph __________ are carried on land by tall __________ or underground __________. Under the __________ thick rubber or plastic __________ carry __________ within them.

b. In the beginning an __________ at the telephone __________ would connect __________ even within the city. Later, automatic __________ were established in cities. The __________ was needed to connect __________ from one city to another. This is called a __________ __________.

c. The word 'tele' is taken from old __________ meaning __________. When you telephone, the wires carry distant __________, television is __________ __________ and the __________ is distant writing.

3. Tick the correct sentences. Correct those that are incorrect:

a. Today ships carry mail only where there are no train or air services.
b. In India, a villager has to walk to the nearest town to collect his letters.
c. The teleprinter uses the English alphabet converted into dots and dashes.
d. India has no STD links with other countries.
e. Insat I-B is the satellite used to broadcast national TV programmes in India.

4. Match columns A and B:

A	B
satellite	the Morse code
telex	portable radio
post	circling the earth
telegraph	teleprinter with dial
transistor	'dak'

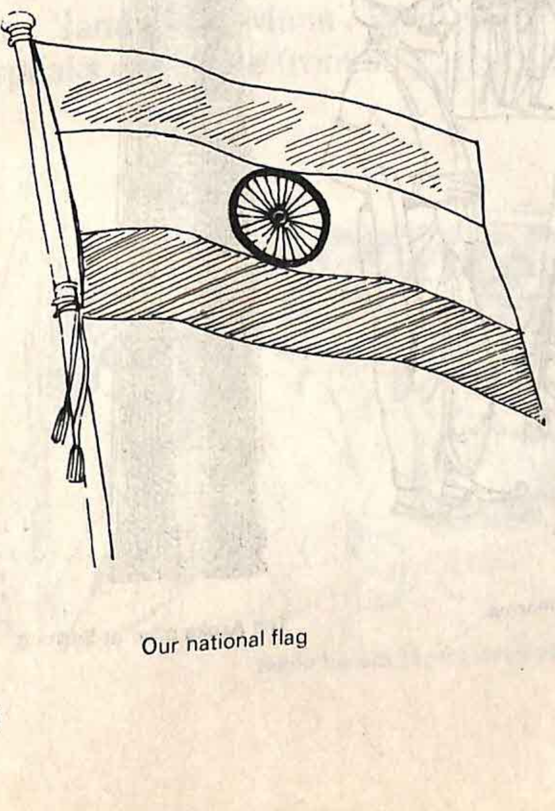
Project work

Make a chart with drawings or pictures, of the various means of communication. For example, show how a letter travels from the person who writes it to the person who receives it; how a message is sent by telegraph; and how programmes are transmitted by radio or TV.

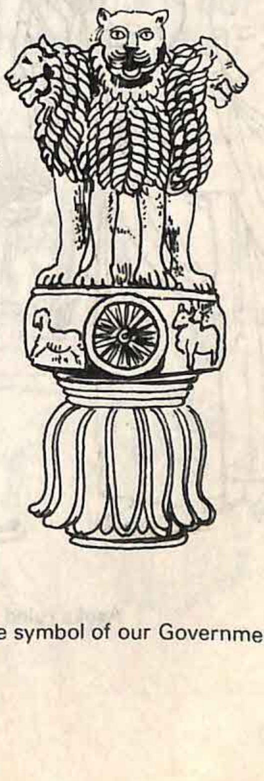
12. Symbols and special days

After Independence, we needed a national flag which all the world and all Indians could recognize as a symbol of India. The Indian flag is in three colours. At the top is a broad saffron (deep orange) stripe, in the middle a broad white stripe and at the bottom a deep green stripe. In the middle of the white stripe is the Asoka Chakra, in navy blue. This chakra represents the Buddha's Wheel of Law, a 'Dharmachakra'. It shows that all life follows a pattern, with one action naturally arising from another, good or bad. Its design is taken from the capital (the head) of the Asoka pillar at Sarnath, where the Buddha preached his first sermon.

For the symbol of the Government of India, we have taken another design from the same pillar – a design showing the lions seated on top of the Sarnath pillar, as seen from one side, with the chakra below them.



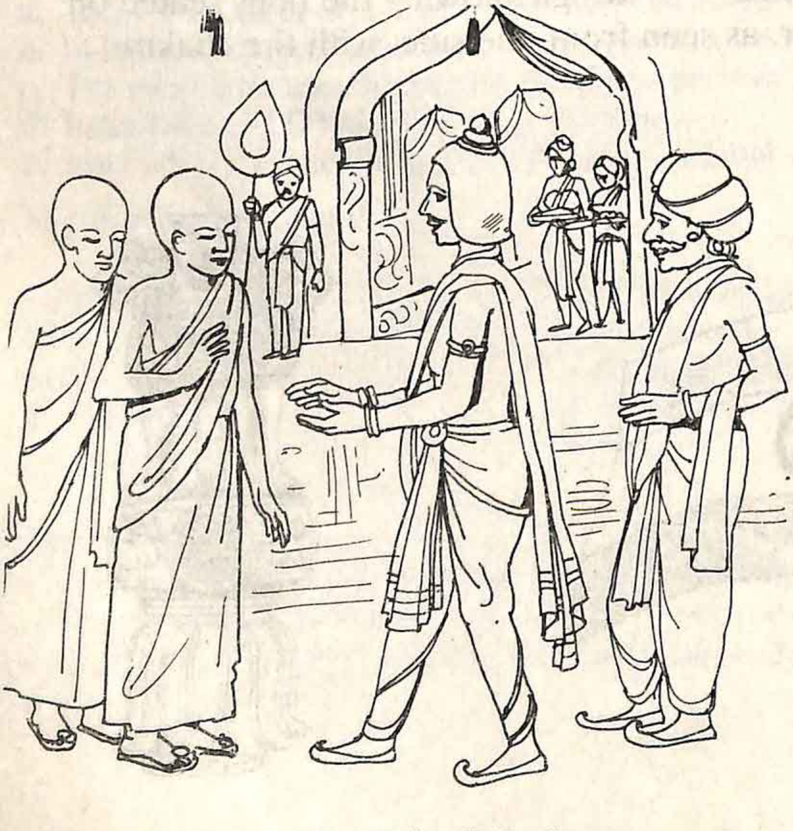
Our national flag



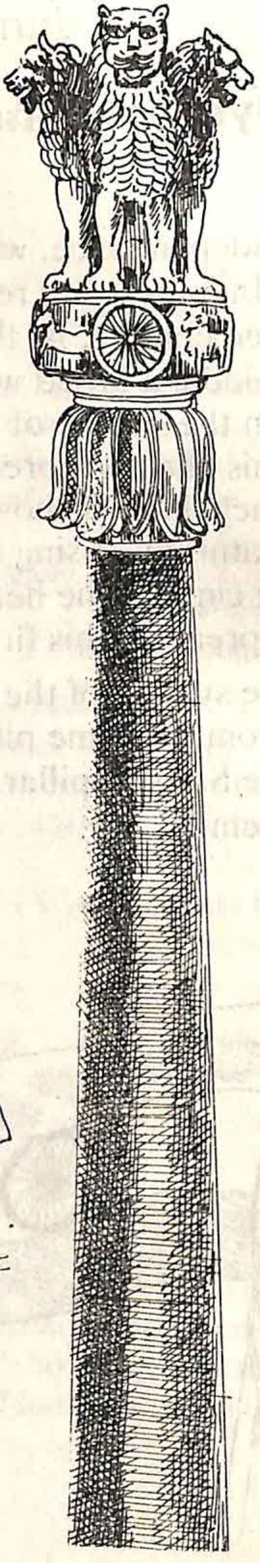
The symbol of our Government

Rule by dharma

These symbols from the Asoka pillar were chosen for two reasons. More than 2000 years ago Asoka ruled a large part of India, setting up rock or pillar inscriptions in Kashmir, Gujarat (the famous Girnar rock inscriptions) and part of today's Andhra Pradesh. Secondly, in later life he became a man of peace, and an emperor whose kingdom was to be ruled not by force but by dharma. To remind ourselves of the great aims of a great king the chakra and the lions of the lion capital of the Sarnath pillar were chosen for the flag and for the official symbol of the Government of India.

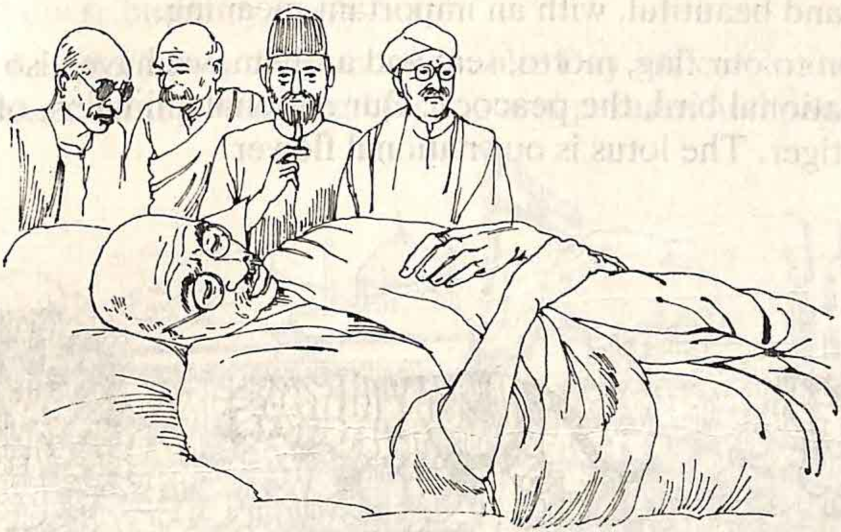


Asoka ruled not by force but by dharma.



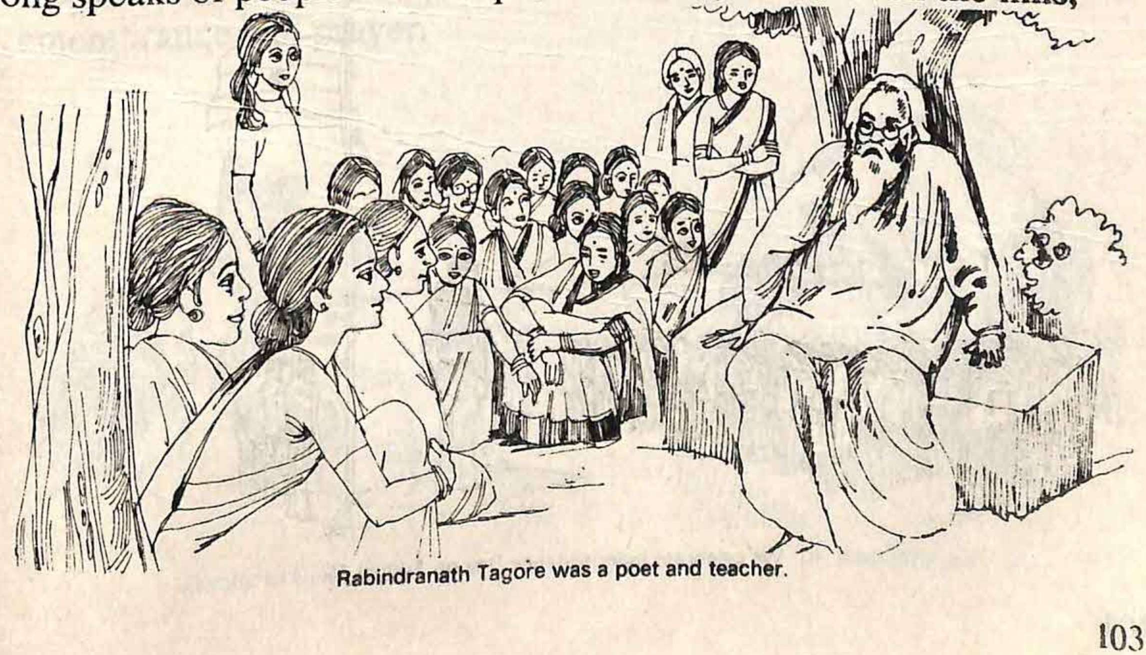
The Asoka pillar at Sarnath

India won independence through a non-violent movement and Mahatma Gandhi, who led this movement, gave great importance to the principles of 'ahimsa' and truth. This idea, that truth and justice should be the basis of all action, is contained in our national motto 'Satyameva Jayate' which means, 'it is truth which triumphs'. You will find this motto inscribed above the government seal with the lion capital.



Gandhi's methods were non-violent.

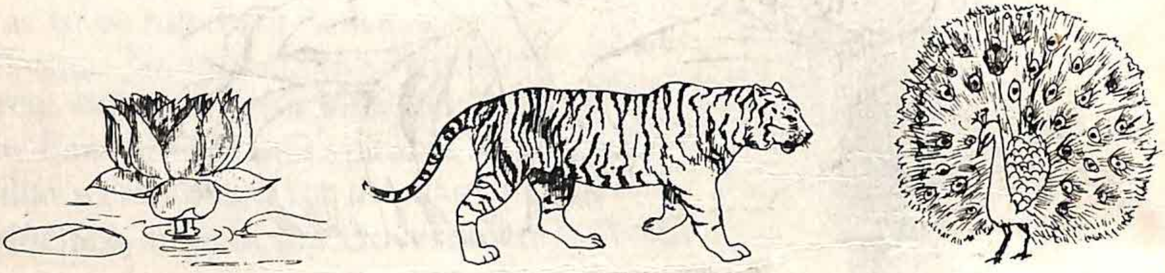
Another national 'symbol' that stands for the unity of India is our anthem, 'Jana Gana Mana'. Written by Rabindranath Tagore, the song speaks of people from all parts of India, and of even the hills,



Rabindranath Tagore was a poet and teacher.

rivers and seas, all joining in joyful praise of India's common destiny – 'Bharata Bhagya Vidhata'. The next time you sing or hear the anthem, listen carefully to the words. They are simple, easy to understand and beautiful, with an important meaning.

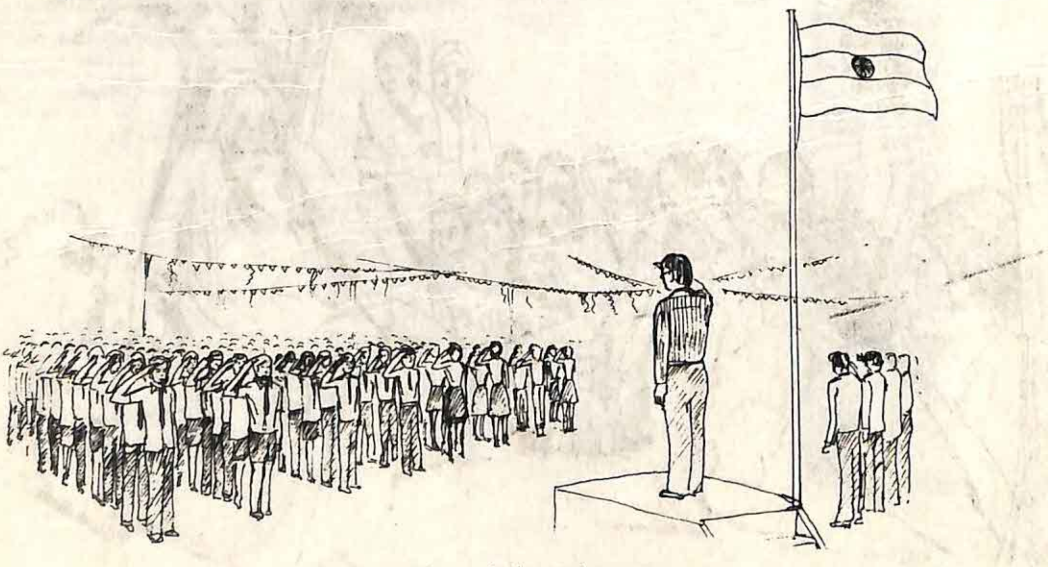
In addition to our flag, motto, seal and anthem, we have also adopted a national bird, the peacock. Our national animal is, of course, the tiger. The lotus is our national flower.



The lotus, the tiger, and the peacock are our national flower, animal and bird.

Special days

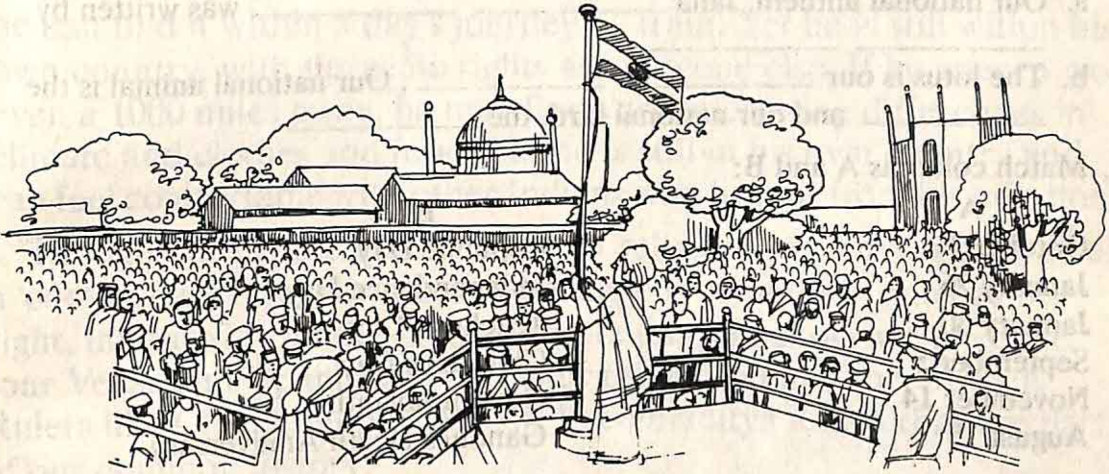
To mark our independence, August 15 is celebrated as Independence Day and is a country-wide holiday. The day the new



We celebrate Independence Day on August 15.

Constitution came into effect, became active law, is also a national holiday, on January 26. It is called Republic Day and in New Delhi there is a parade of members of the army, navy and air force and a pageant contributed by every State.

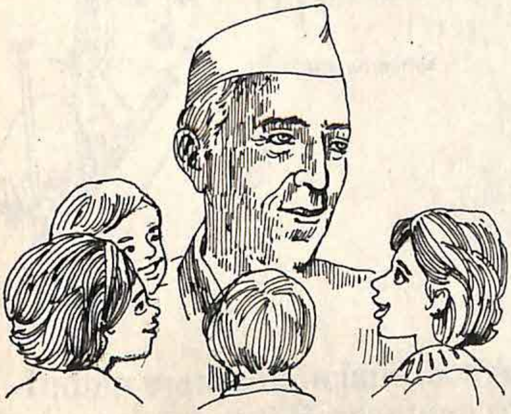
Both Independence Day and Republic Day are celebrated in every part of the country, with flag hoisting and parades and pageantry.



Republic Day celebrations

Other special days observed by us, as Indians, are Gandhi Jayanthi (October 2), Nehru's birthday, which is celebrated as Children's Day (November 14) and Dr. Radhakrishnan's birthday which is celebrated as Teacher's Day (September 5).

January 30, the day of Gandhi's death, is observed as a day of remembrance and prayer.



Jawaharlal Nehru

Dr. Radhakrishnan

Exercises

1. Answer briefly:
   - a. What are the colours found in our national flag?
   - b. What is the meaning of the chakra in our flag and government seal?
   - c. What is our national motto? What does it mean?

2. Fill in the blanks:

a. Our national anthem, Jana __________ __________, was written by __________ __________.

b. The lotus is our __________ __________. Our national animal is the __________ and our national bird, the __________.

3. Match columns A and B:

A	B
October 2	Republic Day
January 26	Independence Day
January 30	Teacher's Day
September 5	Children's Day
November 14	Gandhi Jayanthi
August 15	Gandhi's Death Anniversary

Project work

Learn the words of our anthem and learn to sing it as well. Find out and write down the meaning of the song. The anthem is in Bengali. With your teacher's help, learn a song in another Indian language which is also about praising, loving and serving your country.

13. From Kashmir to Kanyakumari

An Indian is fortunate in being part of such a large, varied and ancient country. Near his own home he finds everything familiar — the language, ways of dressing, kinds of food. When he wants a change, he can find it within a day's journey by train. Yet he is still within his own country, with the same rights as everyone else. If he goes to work even a 1000 miles away, he may find very interesting differences in climate and clothes and food; but he is still in his own country and can feel comfortable with other Indians who live far from his own home.

Though our people follow different religions, we have what we call a 'common cultural heritage'. A heritage is something one has by right, inherited from the past. In our common history we have the four Vedas and Upanishads and later the Koran and the Gospels. Rulers like Chandragupta, Asoka, Vikramaditya and Akbar are part of our common history.

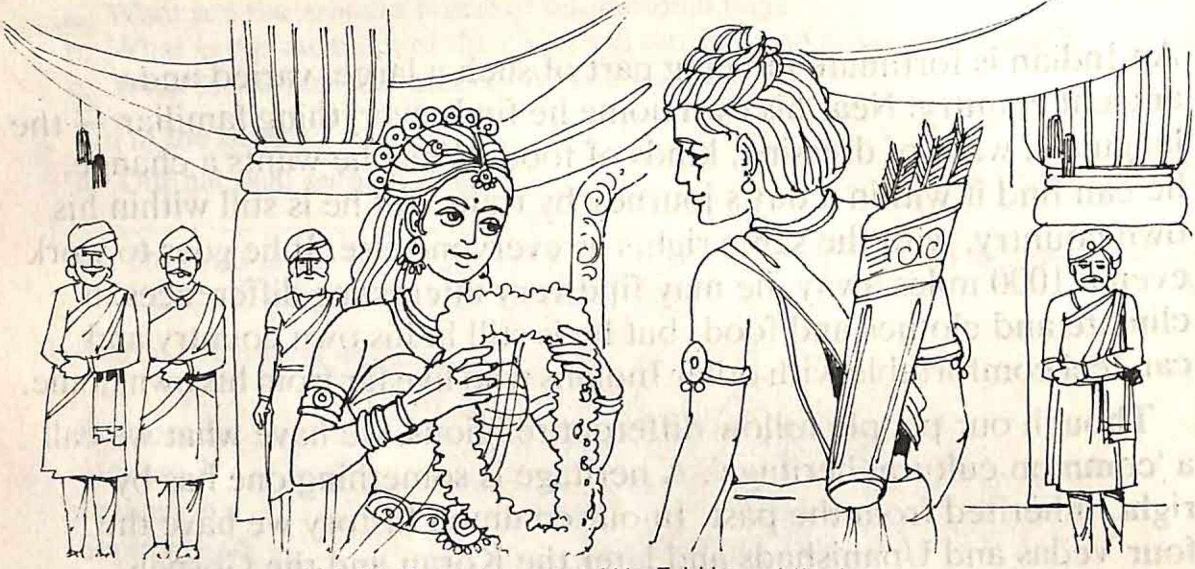
Vikramaditya

Asoka

Akbar

Chandragupta

Indian mathematicians like Aryabhata and Bhaskaracharya of ancient times and Ramanujan of recent times contributed greatly towards the development of mathematics. In fact mathematics is one of the ancient Indian sciences. Valmiki's Ramayana was retold in Hindi by Tulsidas in the north and in Tamil by Kamban in the south.

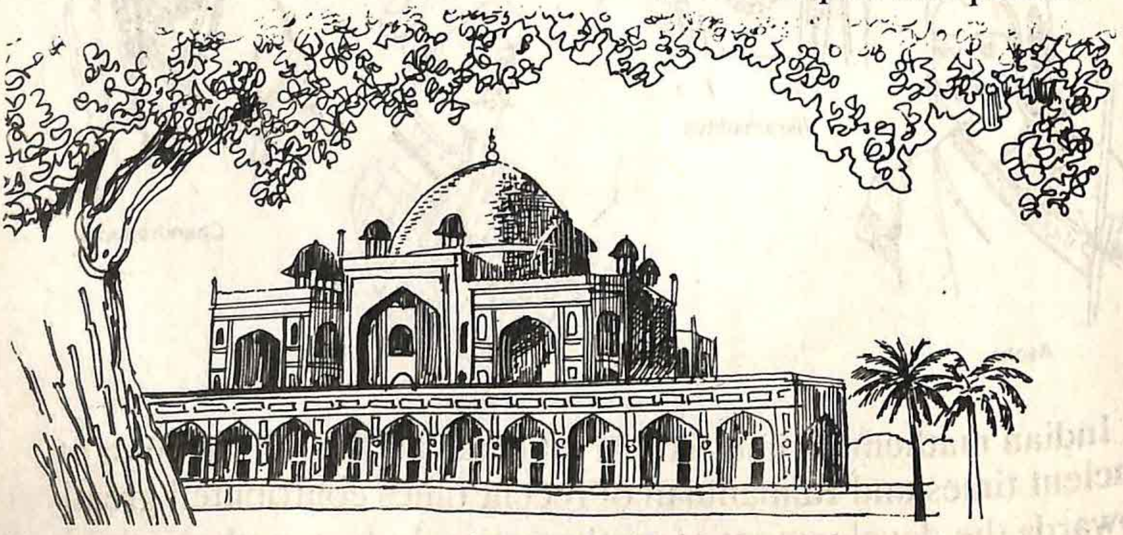


Valmiki's Ramayana was retold by Tulsidas and Kamban

Meera sang in praise of Sri Krishna and Tyagaraja of Sri Rama. In all this, we have remained 'Indians' for centuries past, though the modern State of India was established only in 1947.

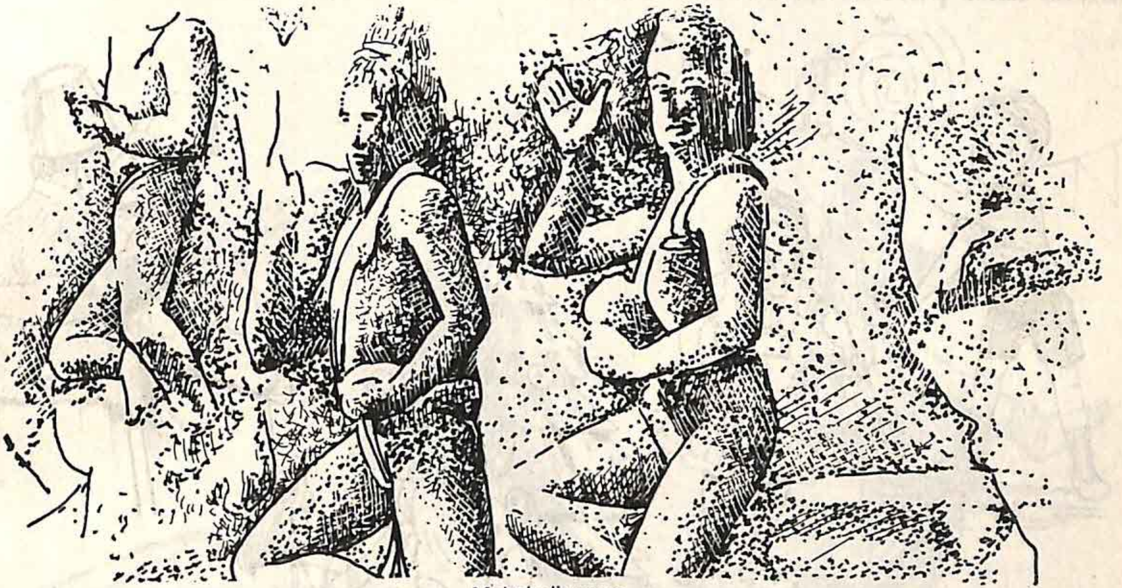
What we have in common

We all take pleasure in the beautiful monuments left by the Mughals – the Taj Mahal and Buland Darwaza in Agra, Humayun's tomb and Shah Jehan's Red Fort in Delhi, the mosques and palaces of



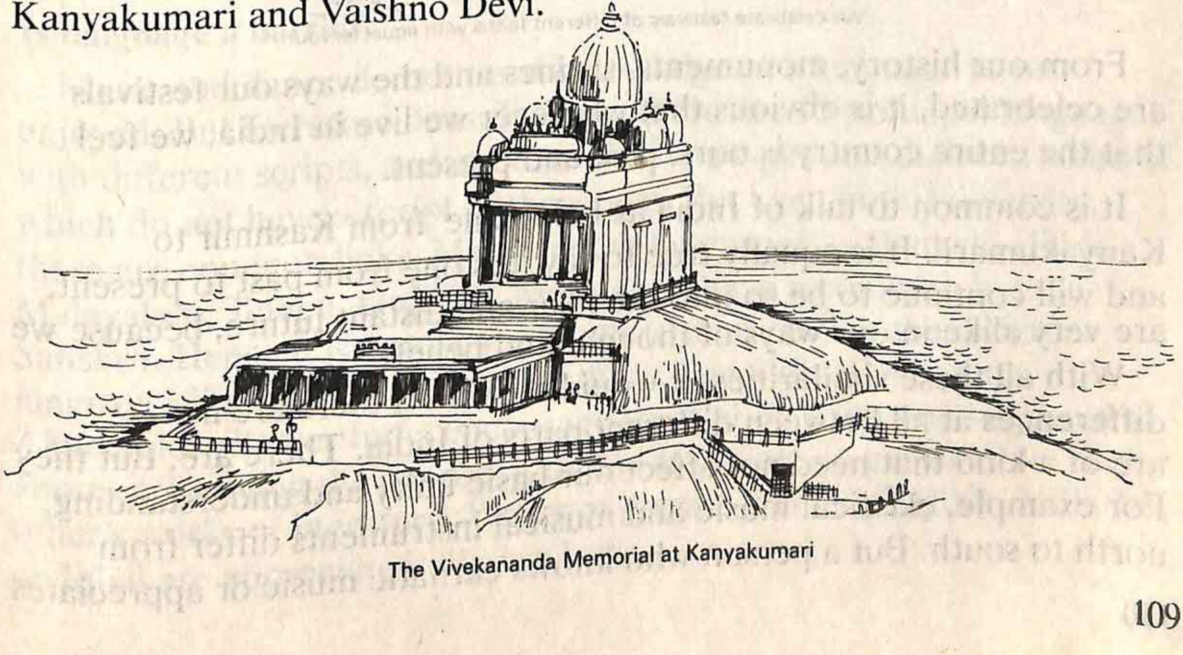
Humayun's tomb

Persian design all over India. We also appreciate the very old rock-cut temples like the Elephanta caves near Bombay, Ajanta and Ellora near Aurangabad in Maharashtra and Mahabalipuram near Madras in Tamil Nadu.



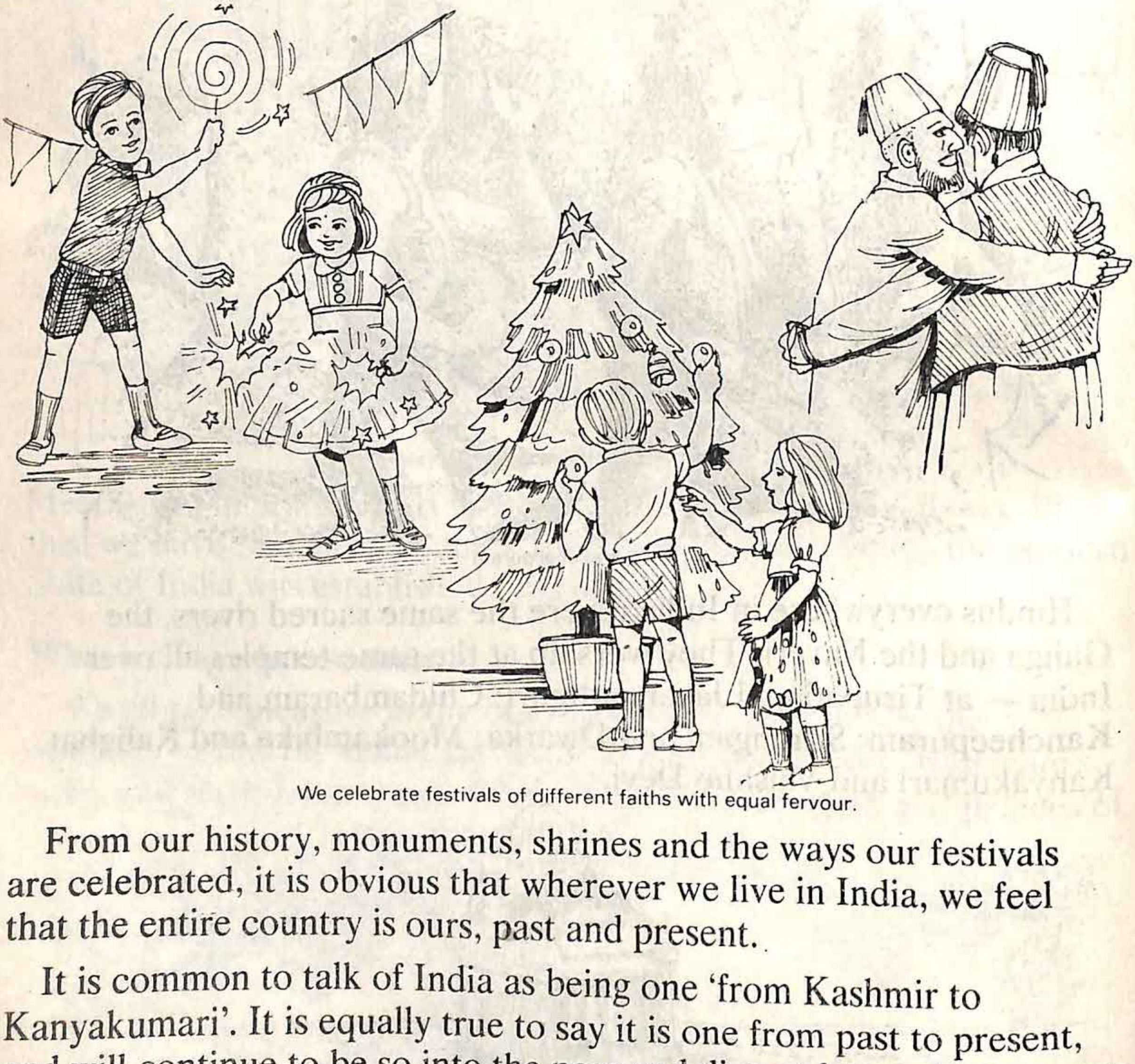
Mahabalipuram

Hindus everywhere in India revere the same sacred rivers, the Ganga and the Kaveri. They worship at the same temples all over India — at Tirupati and Jagannathpuri; Chidambaram and Kancheepuram; Srirangam and Dwarka; Mookambika and Kalighat; Kanyakumari and Vaishno Devi.



The Vivekananda Memorial at Kanyakumari

We celebrate festivals of different faiths with equal fervour. Hindus all over the country celebrate Diwali and Dassera. Muslims and Christians celebrate Id and Christmas. In many places, people of all faiths take part in all these festivals.

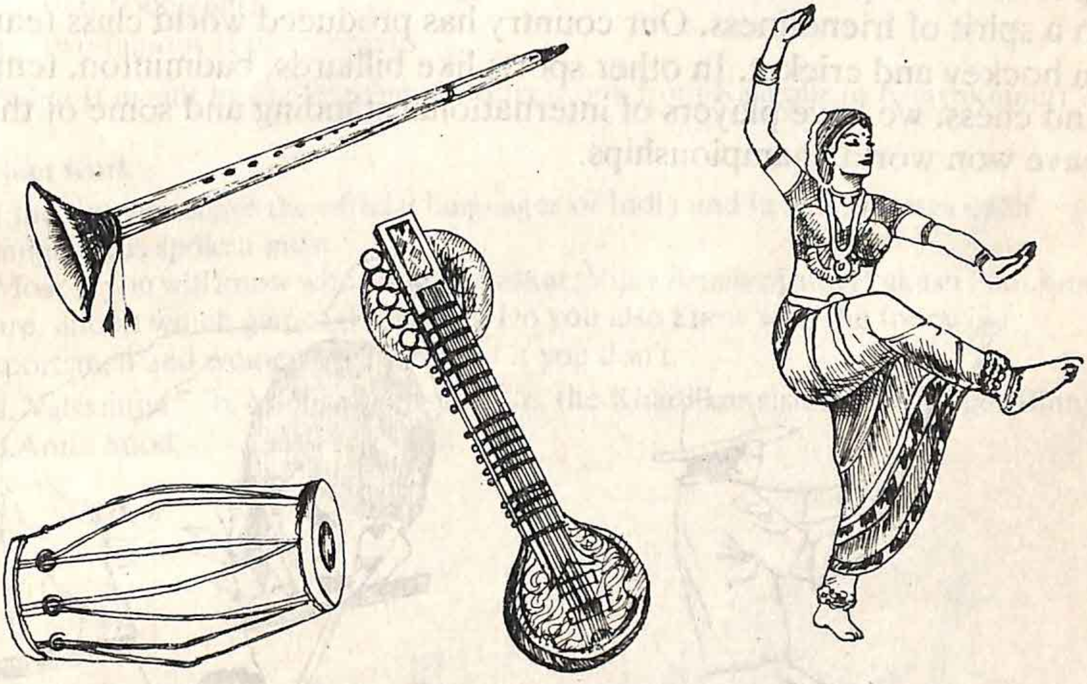


We celebrate festivals of different faiths with equal fervour.

From our history, monuments, shrines and the ways our festivals are celebrated, it is obvious that wherever we live in India, we feel that the entire country is ours, past and present.

It is common to talk of India as being one 'from Kashmir to Kanyakumari'. It is equally true to say it is one from past to present, and will continue to be so into the near and distant future, because we are very alike in our ways of thought and belief.

With all these similarities, it would seem as if there are no differences at all between different parts of India. There are. But they are of a kind that need not affect our basic unity and understanding. For example, classical music and musical instruments differ from north to south. But a person who knows carnatic music or appreciates the veena or nadaswaram, can also enjoy north Indian classical music, listen to the sitar, sarod or shehnai. Further, radio and TV programmes have brought the music and dance of different regions right into our homes.



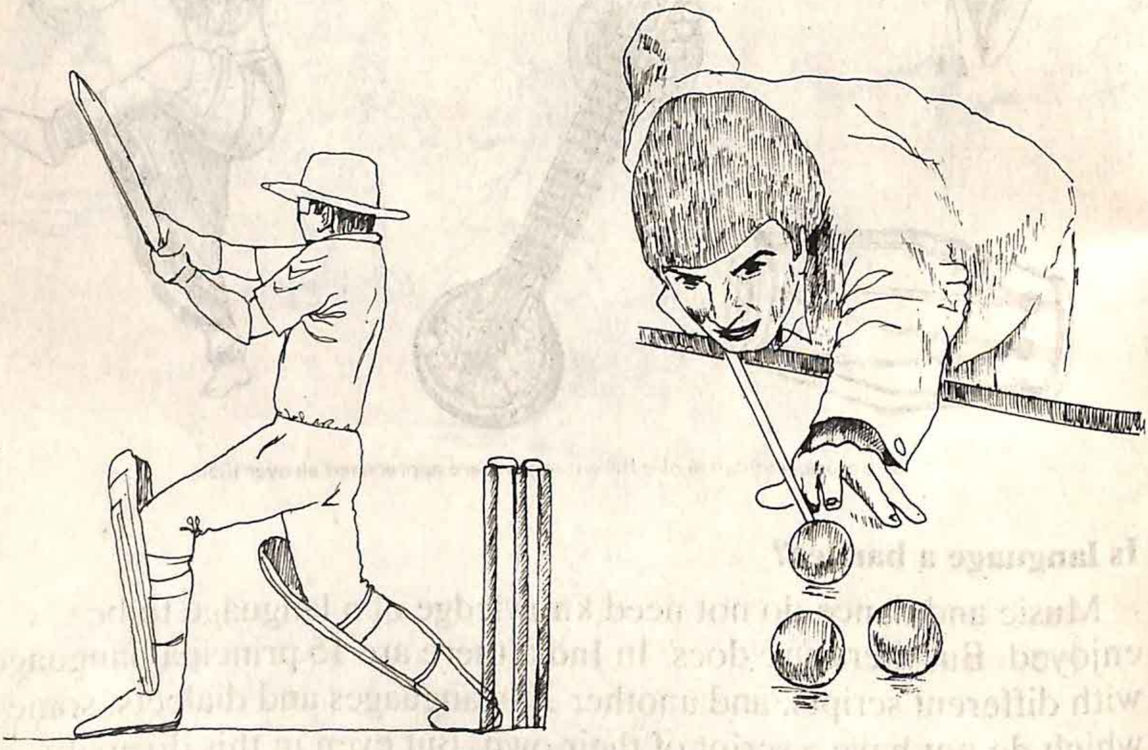
The music and dance of different regions are appreciated all over India.

Is language a barrier?

Music and dance do not need knowledge of a language to be enjoyed. But literature does. In India there are 15 principal languages with different scripts, and another 200 languages and dialects, some of which do not have a script of their own. But even in this diversity, there are common links. Many Indian languages – Bengali, Hindi, Malayalam, Telugu, Gujarati, Marathi – have a common base in Sanskrit. Hence it is not very difficult to learn any of the different languages if you know any one of them. Secondly, the Sahitya Akademies all over India encourage translation from one language to another, enabling the people of different regions to get to know each other's works of literature. Works of great poets like Tagore, Vallathol or Iqbal are appreciated all over India.

Playing together

Sports and games also bring people of different regions closer. Popular sports like cricket, football, hockey and badminton draw crowds in any part of the country. We have national championships for most sports, when sportsmen of different regions compete with each other in a spirit of friendliness. Our country has produced world class teams in hockey and cricket. In other sports like billiards, badminton, tennis and chess, we have players of international standing and some of them have won world championships.



Sports and games bring people together.

So, inspite of many differences in religion, language and ways of living, all the people of India are united by both the past and the present. The past gives us a shared history and tradition. In the present we have in common institutions like our government, our educational system and activities in the sports and cultural fields.

Exercises

1. From our common past name:
    a. Two mathematicians
    b. Two great emperors
    c. Two Mughal monuments
    d. Two poet-saints
    e. Two famous Hindu temples
2. What is meant by the statement, 'India is one from Kashmir to Kanyakumari'?

Project work

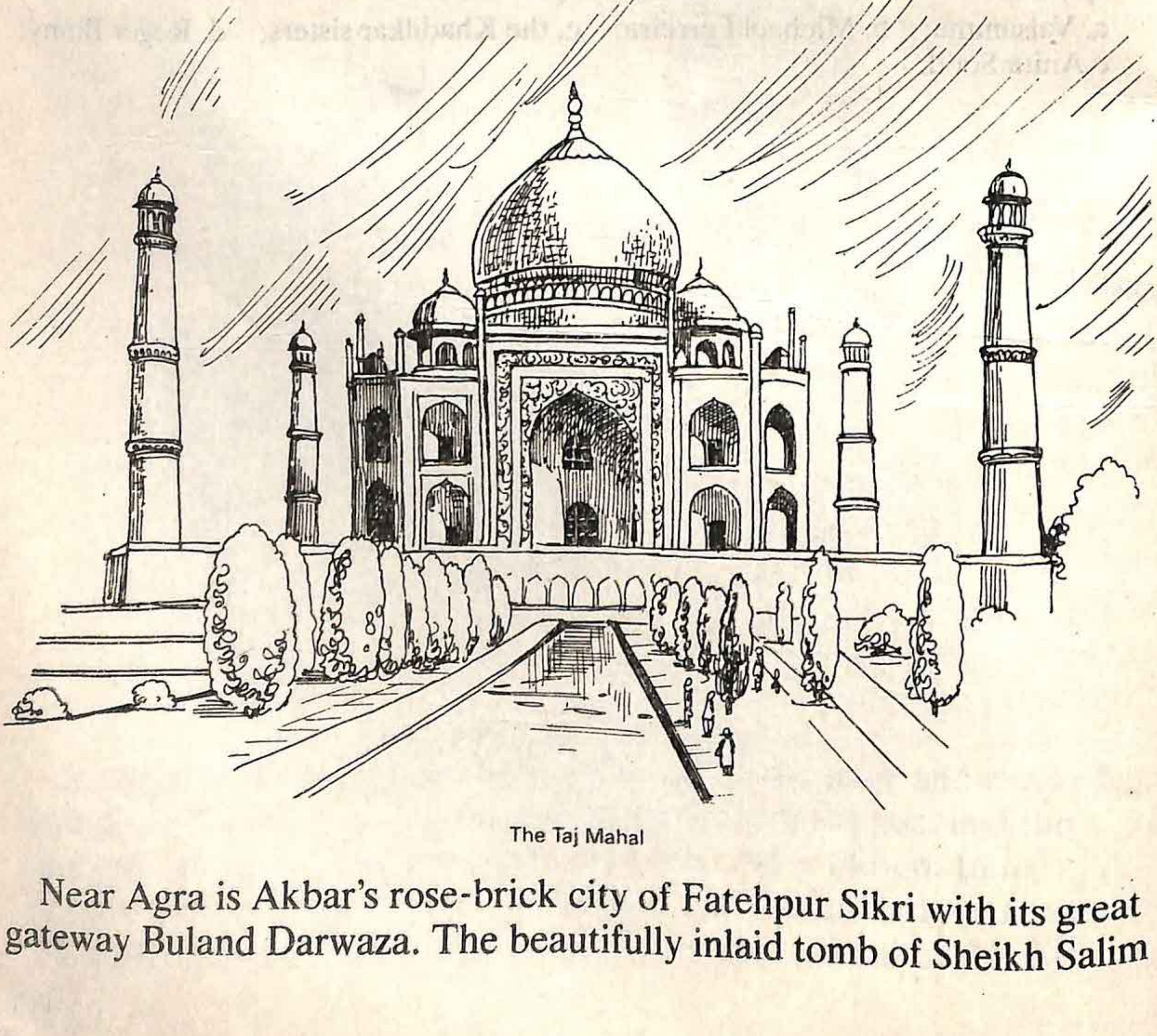
1. Find out which are the official languages of India and in which states each language is spoken most.
2. Most of you will know who Sunil Gavaskar, Vijay Amritraj and Prakash Padukone are, and in which games they excel. Do you also know who the following sportsmen and women are? Find out if you don't.

   a. Valsamma; b. Michael Ferreira; c. the Khadilkar sisters; d. Roger Binny; e.Anita Sood.

14. Monuments of our past

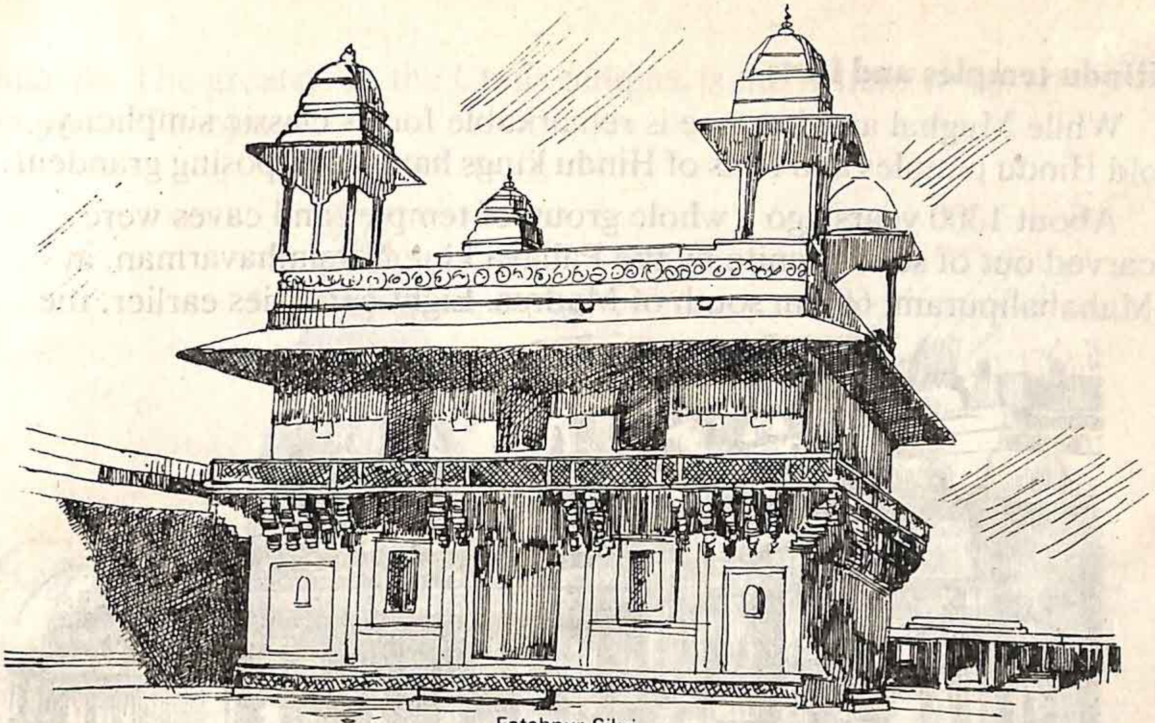
There are many ways of learning about our heritage. One of them is through the various monuments built by famous rulers of the past.

The most famous monument in India is the Taj Mahal. Built as a tomb and memorial to Shah Jehan's beloved queen Mumtaz Mahal, it stands by the Yamuna in Agra, its marble simplicity mirrored in the artificial ponds that stretch before it. Tall green trees, straight as the Taj's own slender minarets, and the green expanse of the well-kept lawns and gardens add to the beauty of the Taj. It took 22 years and a labour force of 20,000 persons to build it.



The Taj Mahal

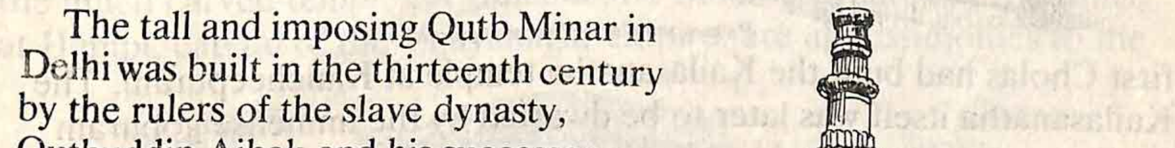
Near Agra is Akbar's rose-brick city of Fatehpur Sikri with its great gateway Buland Darwaza. The beautifully inlaid tomb of Sheikh Salim



Fatehpur Sikri

Chisti, revered by both Hindus and Muslims, is another example of the excellence of Mughal architecture.

The tall and imposing Qutb Minar in Delhi was built in the thirteenth century by the rulers of the slave dynasty, Qutbuddin Aibak and his successor Iltutmish. In and around Delhi we find many historical monuments of the Mughal period. These include Shah Jehan's Jama Masjid and the Red Fort. He also founded a new city, Shahjehanabad, which is now part of the city of Delhi.

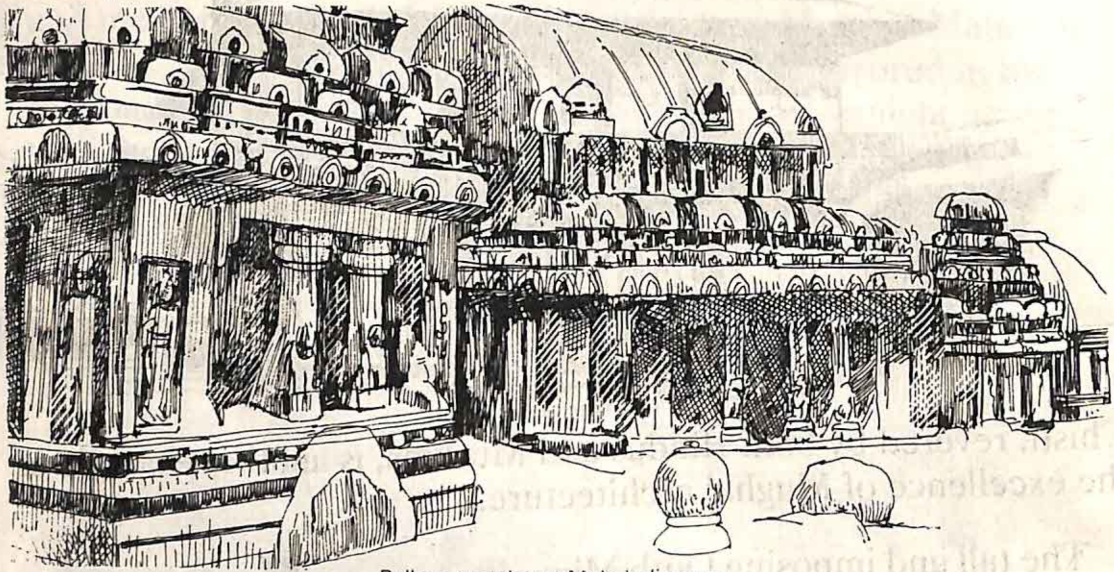


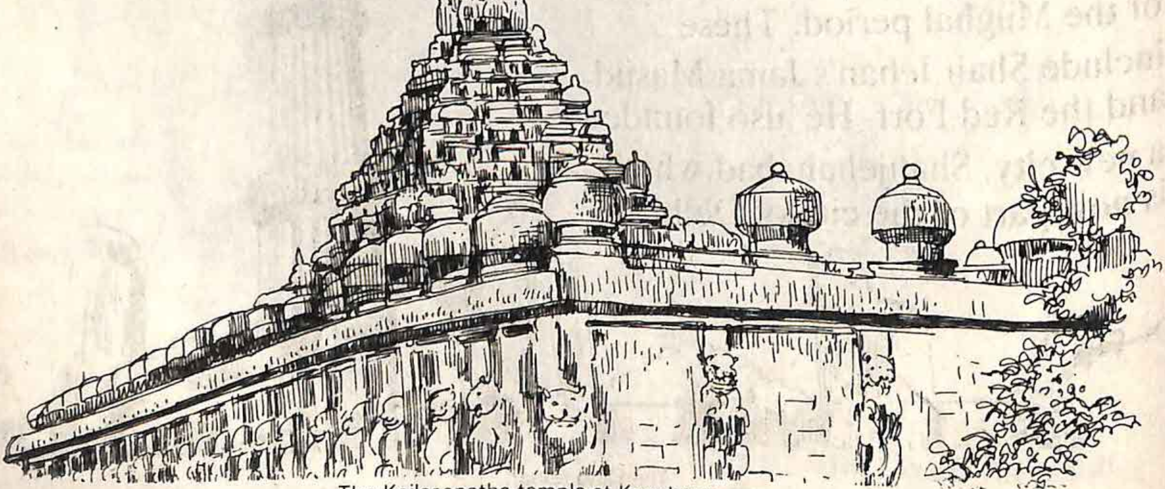
The Qutb Minar

Hindu temples and forts

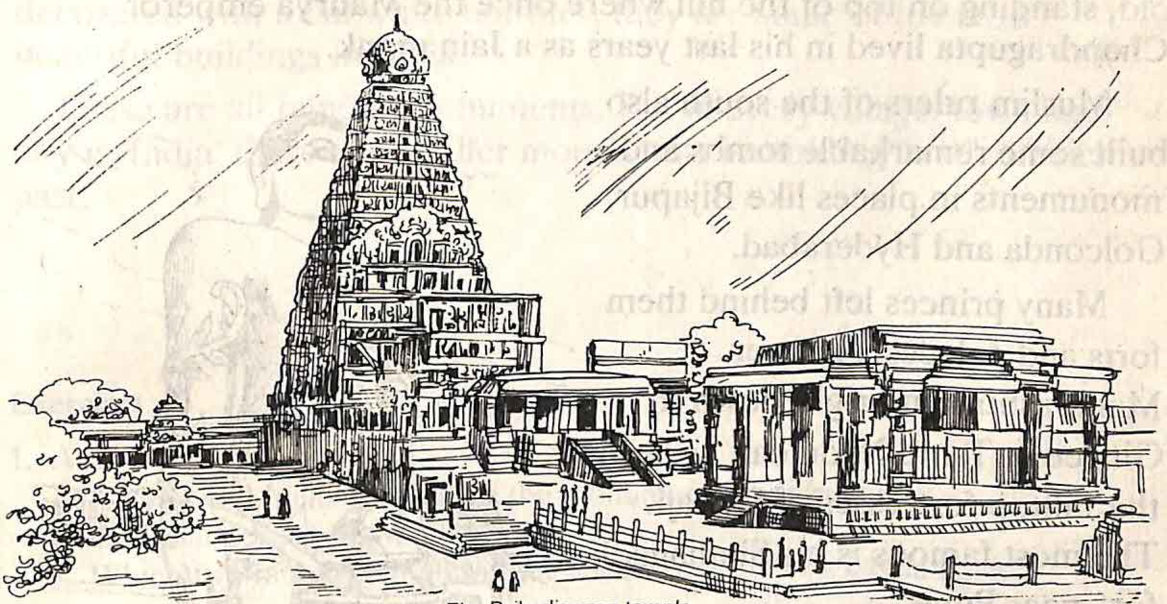
While Mughal architecture is remarkable for its classic simplicity, old Hindu temples and forts of Hindu kings have an imposing grandeur.

About 1300 years ago a whole group of temples and caves were carved out of solid granite by the Pallava king Narsimhavarman, at Mahabalipuram, 60 km south of Madras. Eight centuries earlier, the first Cholas had built the Kailasanatha temple at Kancheepuram. The Kailasanatha itself was later to be dwarfed by the immense gopuram (entrance tower) of the Varadarajaswami temple raised by the


Pallava temples at Mahabalipuram

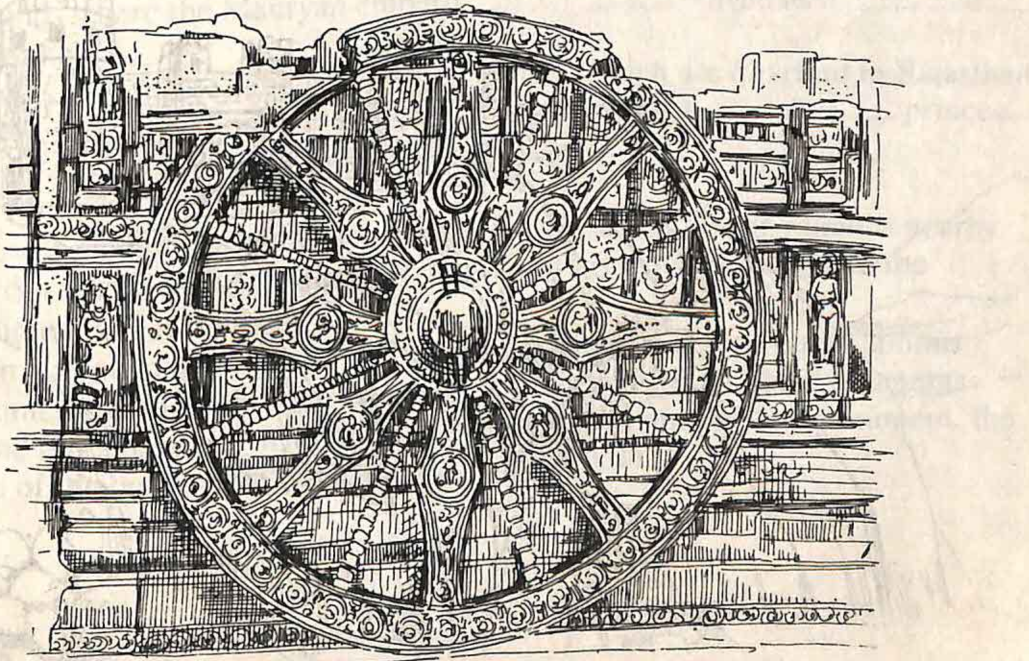

The Kailasanatha temple at Kancheepuram

Pallavas. The greatest of the Chola temples is the Brihadiswara temple in Thanjavur.



The Brihadiswara temple

Temple groups at Khajuraho and the Sun temple at Konarak (Orissa), the much carved temples at Halebid and Belur (Karnataka), the ruins at Hampi, capital of the Vijayanagar empire, are all testimonies to the

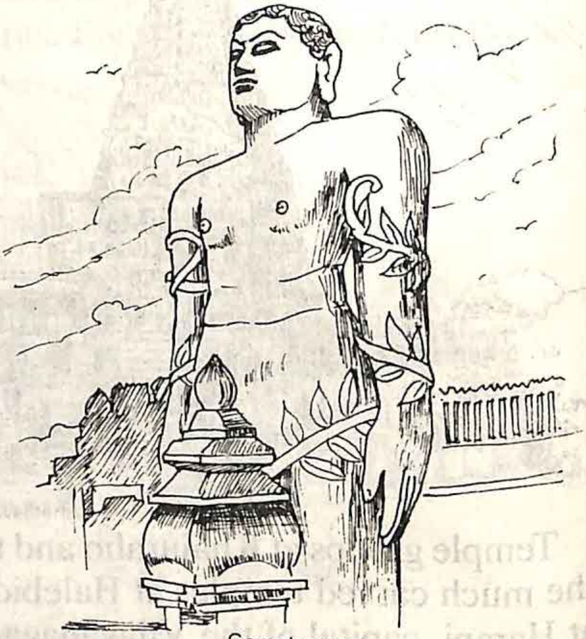


The sun temple of Konarak

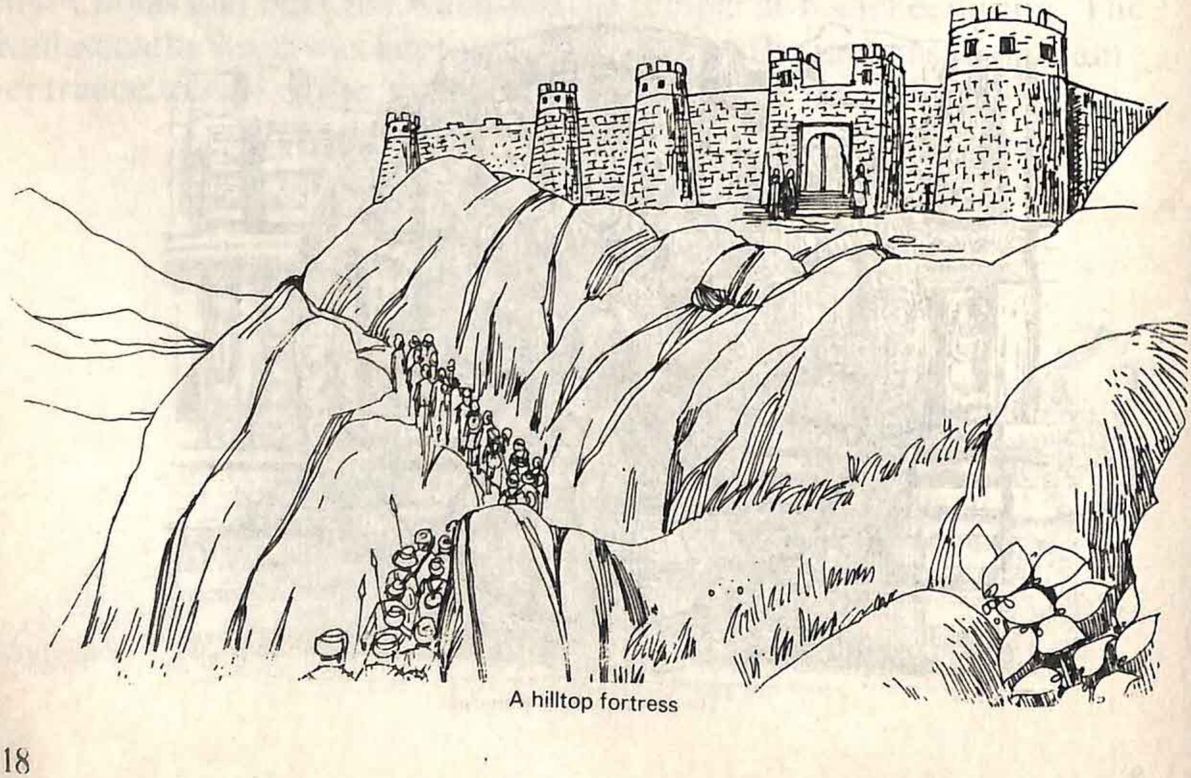
skill and patience of Indian craftsmen. Towering above them, literally, is the Jain Gomateswara statue at Sravanabelagola, over 1200 years old, standing on top of the hill where once the Maurya emperor Chandragupta lived in his last years as a Jain monk.

Muslim rulers of the south also built some remarkable tombs and monuments in places like Bijapur, Golconda and Hyderabad.

Many princes left behind them forts and palaces. All over Maharashtra and right down to Gingee in Tamil Nadu can be seen the hilltop fortresses of Shivaji. The most famous is his Simhagadh fort near Pune.



Gomateswara



A hilltop fortress

Palaces of various kinds can be seen all over Rajasthan, ancient land of the Rajput princes. Built out of local red sandstone and decorated with local white marbles, they are some of the most beautiful buildings in India.

These are all famous monuments. But in every village, town and city in India, there are smaller monuments reminding us of our rich past.

Exercises

1. Answer briefly:
   a. Name two Mughal rulers and the monuments built by them.
   b. Who built the Qutb Minar?
   c. Which two famous temples in the south were built by Chola kings?

2. Fill in the blanks:
   a. Narasimhavarman, the ____________ king, built temples carved out of solid ____________ at ____________.
   b. The Gomateswara statue at ____________ is ____________ years old and stands where the Mauryan emperor, ____________, lived as a ____________ monk.
   c. Red ____________ and white ____________ which are quarried in Rajasthan, were used in building the forts and ____________ of ____________ princes.

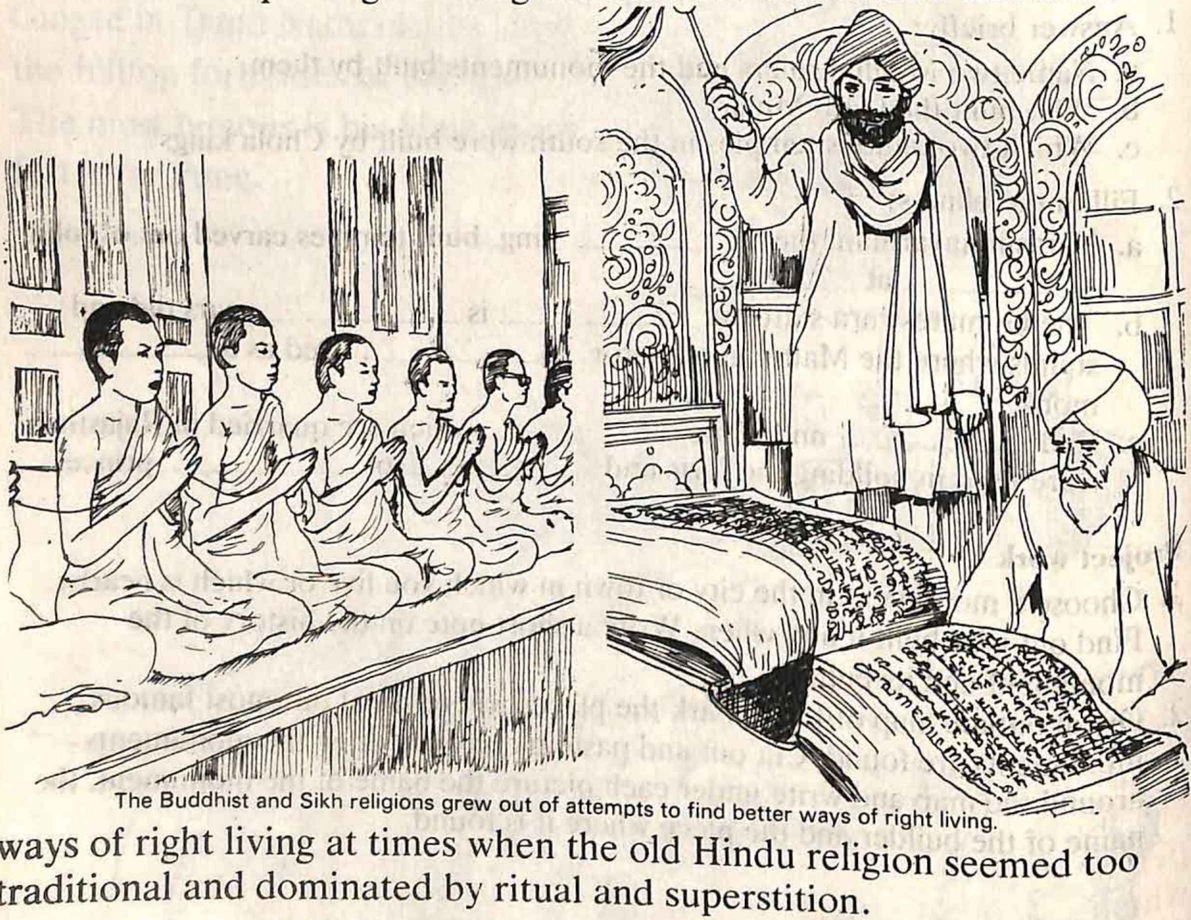
Project work

1. Choose a monument in the city or town in which you live or which is nearby. Find out who built it and when. Write a short note on the history of the monument and its builder.
2. On an outline map of India mark the places where six of our most famous monuments are found. Cut out and paste pictures or draw the monuments around the map and write under each picture the name of the monument, the name of the builder and the place where it is found.

15. Singer saints

Many religions have flourished in India, some having their birth in this country and others being brought from other countries. One of the features of our cultural diversity is that there has been room in the country for so many different faiths.

The oldest religion in India, Hinduism, has over the centuries given rise to many movements. The Buddhist, Jain and Sikh religions grew out of the attempts of great religious teachers to find new and better ways of right living at times when the old Hindu religion seemed too traditional and dominated by ritual and superstition.

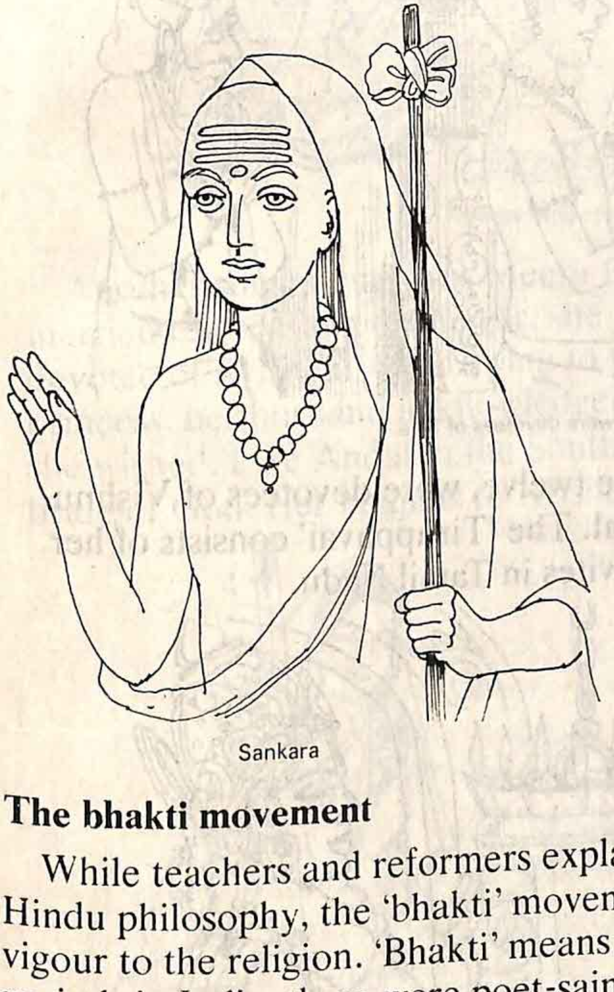


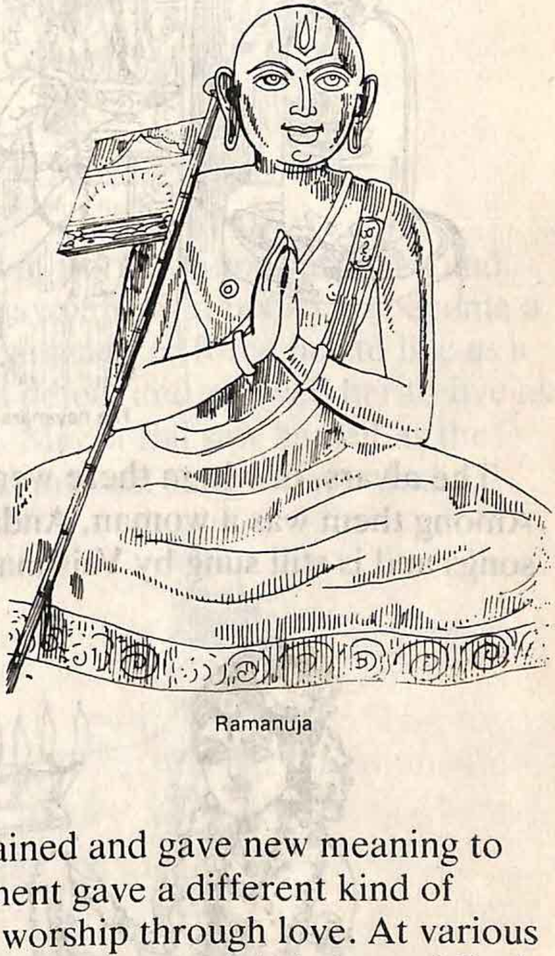
The Buddhist and Sikh religions grew out of attempts to find better ways of right living.

Both Islam and Christianity came to India in very early times. But under Muslim and British rule, these two religions gained many converts. This was partly because they were the religions of the rulers.

But another strong reason for conversion was that both Islam and Christianity preached a direct and simple faith that appealed to many who could not find meaning in the traditional practices of Hinduism.

Hinduism survived because of its tolerance and ability to accept different views. It was also constantly renewed by great Hindu teachers and reformers through the ages. Among the greatest of these were Sankara (8th century), Ramanuja (11th century) and Madhva (13th century). They founded different schools of Hindu philosophy.


Sankara


Ramanuja

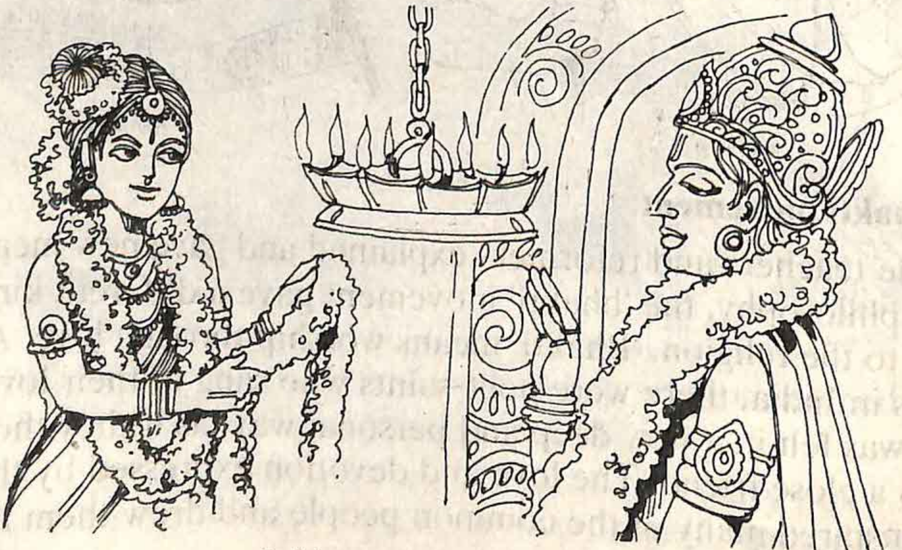
The bhakti movement

While teachers and reformers explained and gave new meaning to Hindu philosophy, the 'bhakti' movement gave a different kind of vigour to the religion. 'Bhakti' means worship through love. At various periods in India, there were poet-saints who sang of their love of God, which was felt in a very deep and personal way, as if they thought of God as a close friend. The love and devotion expressed by these saints inspired many of the common people and drew them into the bhakti movement.

In the 8th and 9th centuries, the bhakti movement found expression in South India in the poetry of the nayanars and alvars. There were sixty-three nayanars who were devotees of Siva. The hymns of the three greatest — Appar, Nanasambandar and Sundaramurti — are collected in a Tamil work called the 'Devaram'.

The nayanars were devotees of Siva.

The alvars, of whom there were twelve, were devotees of Vishnu. Among them was a woman, Andal. The 'Tiruppavai' consists of her songs and is still sung by Vaishnavites in Tamil Nadu.



Andal was a devotee of Vishnu.

In the north, the bhakti movement began from about the 11th century. Tulsidas, in his 'Rama Charit Manas' sang of his faith in Sri Rama. He identified himself so completely with his ideal that, to him, Sri Rama was a living person. Tulsidas served his God by serving worshippers of Rama.

Tulsidas sang of his faith in Rama.

Another singer-saint was Meera Bai. Born a Rajput princess and married to the Rana of Mewar, she gave up royal luxury to become a devotee of Krishna. After trying to persuade or force her to live as a princess, her husband acknowledged defeat and allowed her to live as she wished. Like Andal in the South, Meera Bai saw herself as the bride of God. Her bhajans to Krishna are still sung all over India.

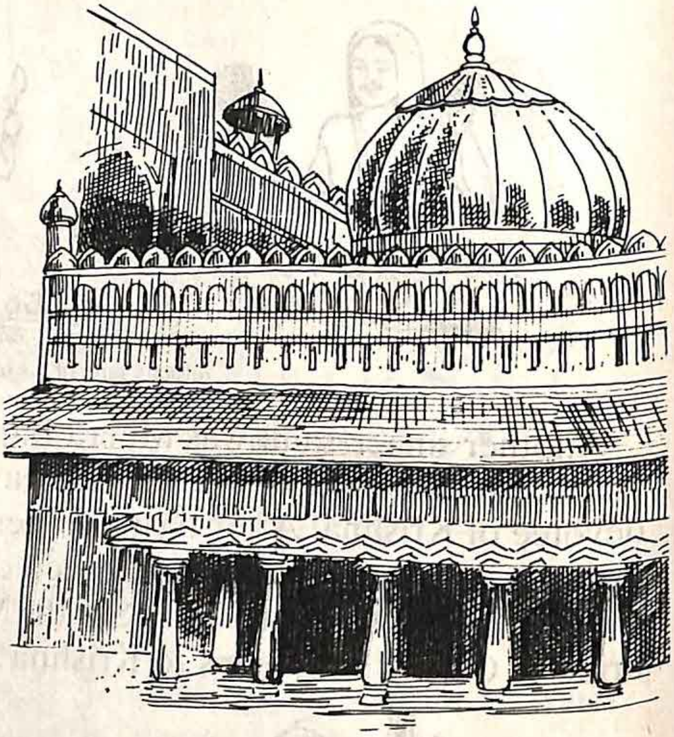
Meera Bai sang bhajans to Krishna.

Chaitanya, Namdeva, Vallabhacharya, Eknath and Tukaram were other singer saints of the bhakti movement.

Sufism

Similar to the bhakti movement was Sufism, a reform movement within Islam. The first Sufi preacher in India was Hazrat Khwaja Muin-ud-Din Chisti (13th century). He asked his followers to live as brothers and respect all religions. Another famous Sufi saint was Nizam-ud-Din Aulia. His tomb in Delhi is a place of pilgrimage for Muslims.

Kabir



The tomb of Nizam-ud-Din Aulia

Both bhakti and Sufism advocated brotherhood, equality and love of God and man. They brought Hindus and Muslims closer and promoted religious tolerance. They also opposed class and caste distinctions and untouchability. Because of this, the movements gained support among the common people.

Among the famous bhakti saints who taught that Hindus and Muslims are brothers was Kabir. Born in a Hindu family but brought up by a Muslim weaver, Kabir was equally at home among Muslims and Hindus. One of his verses says: 'You call him Rama, he calls him Rahim, but the eyes of each of you are directed to the same Allah, the same God.' The same idea is expressed in Gandhi's favourite song, 'Raghupathy Raghava Rajaram'.

Exercises

1. Answer briefly:
   a. Which are the major religions practised in India?
   b. What is the meaning of 'bhakti'?
   c. Who were the nayanars and the alvars? Name two works containing their songs.
   d. Who wrote the 'Rama Charit Manas'?
   e. Name two great Sufi saints.

2. Fill in the blanks:
   a. Hinduism survived because of its __________ and ability to accept different __________. It was also contantly __________ by great Hindu __________ and __________ through the ages.
   b. Kabir was born in a __________ family but brought up by a __________ weaver. He taught that Hindus and __________ are __________.

3. Match columns A and B:

A	B
Sankara	Devaram
Andal	Rama Charit Manas
Tulsidas	Rajput princess
Nayanars	Tiruppavai
Meera Bai	Sufi saint
Nizam-ud-Din Aulia	Hindu philosopher

Project work

Chaitanya, Namdeva, Vallabhacharya, Eknath and Tukaram were some of the singer saints of the bhakti movement. Find out some details about the life and work of each of them.

16. The reformers

In the nineteenth century, there were several Indian reformers who wished to change and improve Indian society. They recognised that we would have to get rid of many superstitions and evils in our religious and social practices. These reformers wished to combine the advantages of modern western education with a renewal of all that was best and worthwhile in our ancient tradition.

Raja Ram Mohan Roy

One of the first religious and social reformers of this period was Raja Ram Mohan Roy. He was born in Bengal in 1774. He studied Sanskrit and the Hindu religion as well as English. In his youth, Ram Mohan Roy worked for the British East India Company.

In 1829, he founded the Brahmo Samaj. Its aim was to base the practice of Hinduism on the Vedas and Upanishads without any of the superstitions attached to it. The Samaj condemned the caste system, child marriage and sati. (Sati is the burning to death of a widow on her husband's funeral pyre. This was then frequently practised among Hindus.)

Because Hindu reformers like Ram Mohan Roy opposed sati, the British government was able to pass a law forbidding it. Ram Mohan

Raja Ram Mohan Roy

Roy also spoke against child marriage and supported the re-marriage of widows. He was one of the first reformers to work for improvement in the position of women in Hindu society.

Raja Ram Mohan Roy died in 1833.

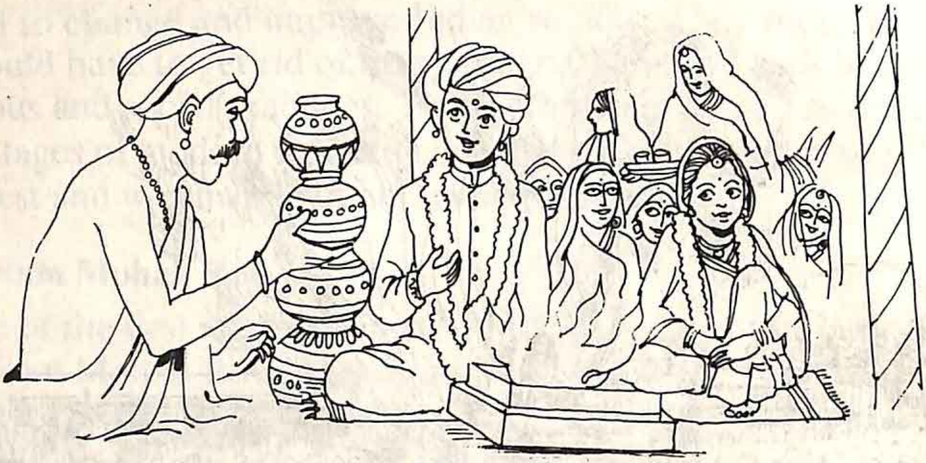
Sati

Swami Dayanand Saraswati

Yet another reformer who wished to purify Hinduism by returning to Vedic practice was Swami Dayanand Saraswati. Born in 1824 in Kathiawar State, he became a sanyasi in his childhood. In 1875 he founded the Arya Samaj which has become a great social, educational and religious movement.

Swami Dayanand Saraswati

Swami Dayanand wished to preserve the purity of Vedic Hinduism. He fought against untouchability and the caste system which he saw as later additions to Hinduism. He supported the education of women and widow remarriage and opposed the purdah system and child marriage.



Child marriage

Swami Dayanand supported the spread of modern English education. The Arya Samaj now has many schools and colleges. He died in 1883.

Swami Vivekananda

Swami Vivekananda was born in Calcutta in 1861. He was a disciple of Ramakrishna Paramahansa and founded the Ramakrishna Mission in 1896. Vivekananda wished to revive the glory of Hinduism and

Swami Vivekananda

Ramakrishna Paramahansa

create self-confidence in the people of India. He wished to get rid of superstitious practices.

In 1893 Vivekananda attended the Parliament of World Religions in Chicago. He explained the greatness of Hinduism to many audiences, both abroad and at home.

Vivekananda died in 1902 but the Ramakrishna Mission continues to serve the people through its schools, hospitals, libraries and orphanages.

Annie Besant

The Theosophical Society was founded in 1875 in New York and its headquarters was moved to Adyar (near Madras) in 1886. In 1893, Annie Besant, an Irish Theosophist, came to India and adopted this country as her home. Under her leadership, the Theosophical Society grew in influence and membership.

The Society believed in universal brotherhood and in the revival of the religious and philosophical traditions of ancient religions like Hinduism.

Annie Besant was also one of the leaders of the Home Rule Movement which demanded self-government for Indians. She was an associate of many political leaders and social reformers who were to be active in our struggle for independence.

Annie Besant

Other reformers

Many other reformers worked during this period for the improvement of Indian society. Iswar Chandra Vidyasagar of Bengal and Pandita Rama Bai of Maharashtra were prominent among those who fought to improve the position of women in India.

The reformers saw that our society had to get rid of evils like sati that were part of it, before we could fight the evil of foreign domination. They helped the spread of modern scientific education and attitudes. They also helped to establish the self-confidence that was necessary before Indians could organise and fight for independence.

Iswar Chandra Vidyasagar

Pandita Rama Bai

Exercises

1. Answer briefly:
    a. What were the aims of the Brahmo Samaj?
    b. Which Hindu reformer worked to make the practice of sati illegal?
    c. Name the institution founded by Swami Dayanand Saraswati.
    d. Who founded the Ramakrishna Mission? How did it get its name?
    e. What were the two movements in which Annie Besant was active?
2. Tick the correct sentences. Correct those that are incorrect:
    a. Raja Ram Mohan Roy supported child marriage.
    b. The Arya Samaj runs many schools and colleges.
    c. Vivekananda attended the Parliament of World Religions in New York in 1839.
    d. Annie Besant devoted her life to the Theosophical Society and had no interest in politics.
    e. Iswar Chandra Vidyasagar and Pandita Rama Bai worked to improve the position of women in India.

3. Fill in the blanks:
   a. Because Hindu ____________ like Ram Mohan Roy opposed ____________ , the British ____________ was able to pass a law ____________ it.
   b. The reformers helped to spread modern scientific ____________ and ____________ . They also helped to establish the ____________ that was necessary before Indians could fight for ____________ .

Project work

Sati, child marriage and dowry are some of the evils of Indian society which are forbidden by law. Discuss in class if any of these is still practised and why it should be stopped.

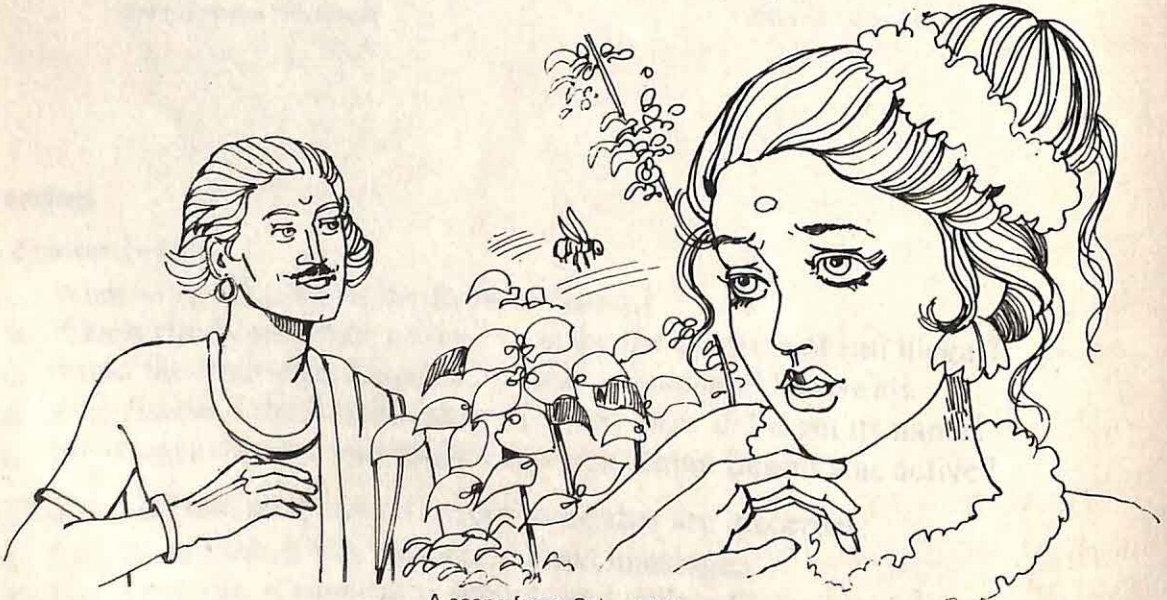
UNIT VI *WRITERS AND SCIENTISTS OF INDIA*

17. Great writers

From the time of the Vedas there have been great works of literature produced in India. The Vedic Age of the Aryans gave us the four great Vedas, the Upanishads, the two major epics (the Ramayana and the Mahabharata), and the Puranas.

The Gupta Age

Another period in ancient India which produced great works of literature was the Gupta Age. The Sanskrit poet, Kalidasa, belonged to this period. According to legend, he was an illiterate youth who was given the gift of poetry by the Goddess Kali. Kalidasa's most famous poems are 'Megadhuta', 'Raghuvamsa' and 'Kumarasambhava'. He was also a dramatist and his most famous play is 'Sakuntala'.

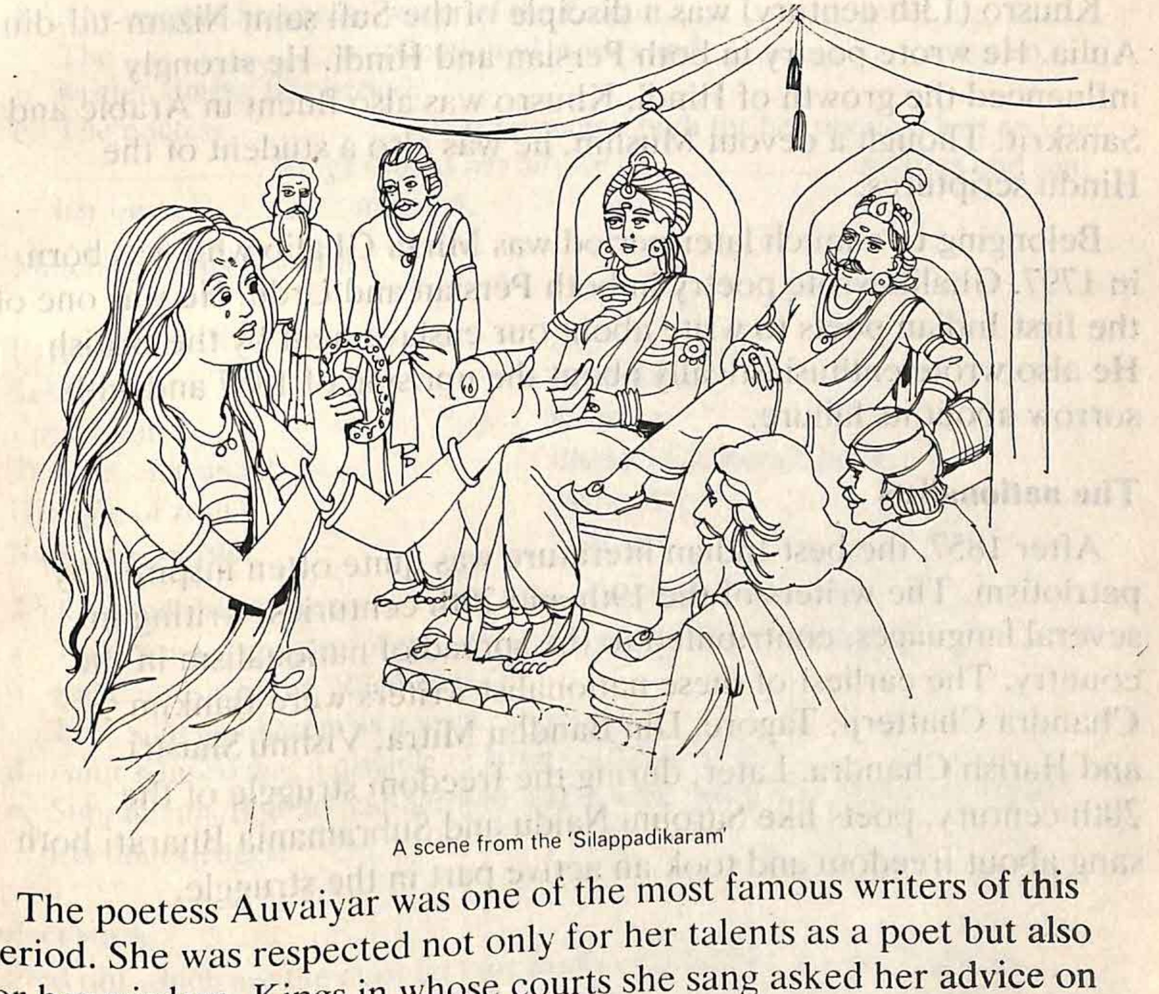


A scene from Sakuntala'

Other poets, dramatists and prose writers also contributed to Sanskrit literature in this period. Among the outstanding prose writers was Bana. The 'Panchatantra', a collection of stories and fables, was also written during the Gupta Age.

Tamil literature

Sanskrit scholarship and literature also existed in South India. But the languages of the South produced their own literature as well. The Sangam Age (during the first three or four centuries A.D.) produced the earliest great works of Tamil literature now existing. The 'Ahananuru' and the 'Purananuru' are poems of this period. The 'Tolkappiyam' is a work on Tamil grammar. The 'Silappadikaram' is a story poem.



A scene from the 'Silappadikaram'

The poetess Auvaiyar was one of the most famous writers of this period. She was respected not only for her talents as a poet but also for her wisdom. Kings in whose courts she sang asked her advice on political matters and even sent her on diplomatic missions to other kings.

Two other great names in Tamil literature are Tiruvalluvar who wrote the 'Kural' in the 6th century A.D. and Kamban (12th century A.D.) who rendered the Ramayanam in Tamil.

The Muslim influence

The literature of our past was mostly religious in nature and was written in many languages. During the period of the bhakti movement and Sufism, the singer saints, both Hindu and Muslim, contributed a great deal to Indian poetry and music.

The coming of Islam and of Muslim rulers to India helped to produce works of literature in Persian and Urdu. Two famous poets in these languages were Amir Khusro and Mirza Ghalib.

Khusro (13th century) was a disciple of the Sufi saint Nizam-ud-din Aulia. He wrote poetry in both Persian and Hindi. He strongly influenced the growth of Hindi. Khusro was also fluent in Arabic and Sanskrit. Though a devout Muslim, he was also a student of the Hindu scriptures.

Belonging to a much later period was Mirza Ghalib who was born in 1797. Ghalib wrote poetry in both Persian and Urdu. He was one of the first Indian poets to write about our enslavement by the British. He also wrote enthusiastically about the uprising of 1857 and with sorrow about its failure.

The nationalists

After 1857, the best Indian literature was quite often inspired by patriotism. The writers of the 19th and 20th centuries, writing in several languages, contributed to the spread of nationalism in the country. The earliest of these nationalist writers were Bankim Chandra Chatterji, Tagore, Din Bandhu Mitra, Vishnu Shastri and Harish Chandra. Later, during the freedom struggle of the 20th century, poets like Sarojini Naidu and Subramania Bharati both sang about freedom and took an active part in the struggle.

Exercises

1. Answer briefly:
   a. What are the major works of the Vedic Age?

b. Who was Kalidasa? Name two of his works.
c. What was the language of Sangam literature?
d. Give the title of a work on Tamil grammar.
e. Who was the author of the 'Kural'?
f. Name two famous Muslim poets. What languages did they use?

2. Fill in the blanks:

a. The Vedic Age of the ____________ gave us the four great ____________, the Upanishads and the two major epics. These are the ____________ and the ____________.

b. The outstanding prose writer of the Gupta ____________ was ____________. The ____________, a collection of stories and ____________, was also written during this period.

c. The poetess ____________ was respected both for her poetic talent and her ____________. Kings sought her advice on ____________ matters and sent her on ____________ missions.

3. Match columns A and B:

A	B
Puranas	Sangam Age
Sakuntala	Amir Khusro
Purananuru	Kamban
Tamil Ramayanam	Bankim Chandra Chatterji
Disciple of Aulia	Vedic Age
Nationalist writer	Kalidasa

4. Tick the correct sentences. Correct those that are incorrect:

a. The Puranas are part of the literature of the Sangam period.
b. Kalidasa wrote the 'Raghuvamsa'.
c. The 'Silappadikaram' is a work on grammar.
d. Amir Khusro was a disciple of Nizam-ud-din Aulia.
e. Subramania Bharati and Sarojini Naidu were poets who took part in the freedom struggle.

Project work

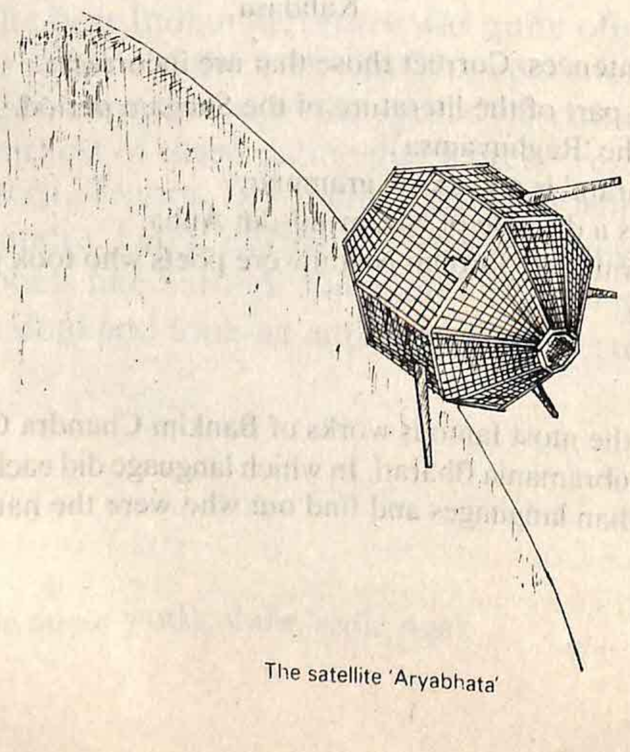
1. Find out which are the most famous works of Bankim Chandra Chatterji, Sarojini Naidu and Subramania Bharati. In which language did each of them write?
2. Choose any four Indian languages and find out who were the nationalist writers in those languages.

18. Our scientists

India has produced many outstanding scientists whose contributions have earned them honour and fame all over the world. Some of these scientists, like Aryabhata and Bhaskaracharya who lived long ago, not only contributed substantially to the development of mathematics and astronomy but also laid the foundation for modern mathematics. More recently, Ramanujan, Sir C.V. Raman and Homi Bhabha were among other Indian scientists who won fame at home and abroad.

Aryabhata

Aryabhata was not only a distinguished mathematician but also a scholar in astronomy. He is said to have lived in the 5th century A.D. at Pataliputra (modern Patna). His treatise on mathematics and astronomy, the 'Aryabhatiya' is the earliest known work on these subjects. Its popularity was such that it continued to be the standard text in India upto the end of the 16th century A.D. The first Indian satellite put into orbit in 1975 was named after this great scientist of ancient India.



The satellite 'Aryabhata'

Bhaskaracharya

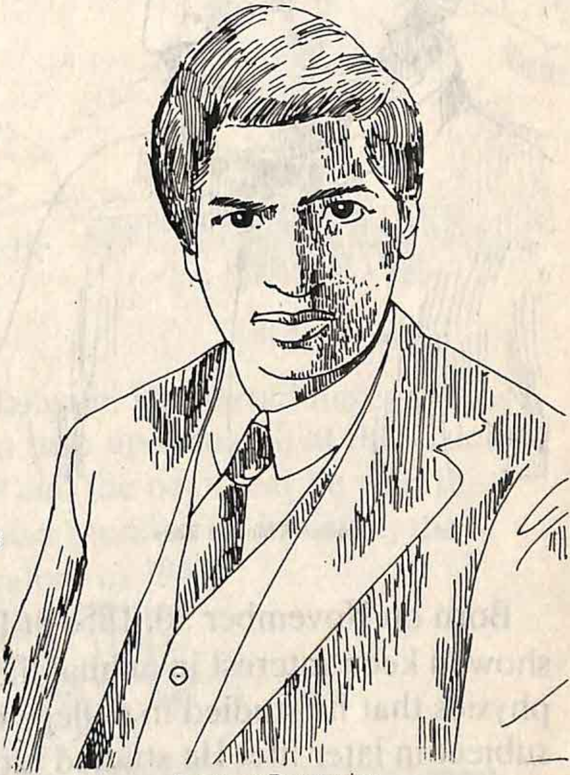
Like Aryabhata, Bhaskaracharya too was a great mathematician-astronomer. He was born in 1114 A.D. and lived in Vijjadavida near the Sahya mountain. We do not now know the exact location of this place.

Coming from a family of scholars, Bhaskaracharya wrote his first book, 'Siddhantasiromani', at the age of 36. His other works include 'Lilavati' which the Mughal emperor, Akbar, had translated into Persian. It is a treatise on arithmetic and geometry.

Bhaskaracharya's interests were not confined to science. He was also interested in literature and was himself a poet. Two of India's satellites in space are named Bhaskara I and Bhaskara II. They were launched from Volgograd, a Soviet cosmodrome, in 1979 and 1981 respectively.

Ramanujan

Another Indian mathematician to win world-wide fame was Srinivasa Ramanujan. Born on December 22, 1887 in a poor family, Ramanujan was at home with figures even in early childhood. Such was his interest in mathematics that he neglected other subjects at school. This resulted in his failure to secure promotion to the senior class and the loss of a scholarship that he had managed to get earlier. As a result, he lived for several years in poverty before his genius was recognised and he was sent to Cambridge to continue his research in mathematics.

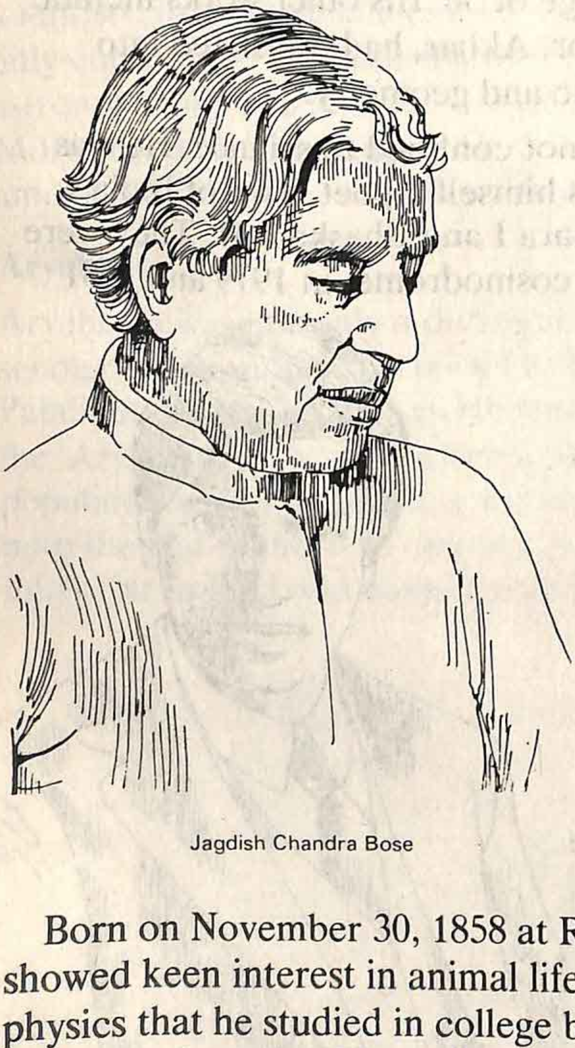


Srinivasa Ramanujan

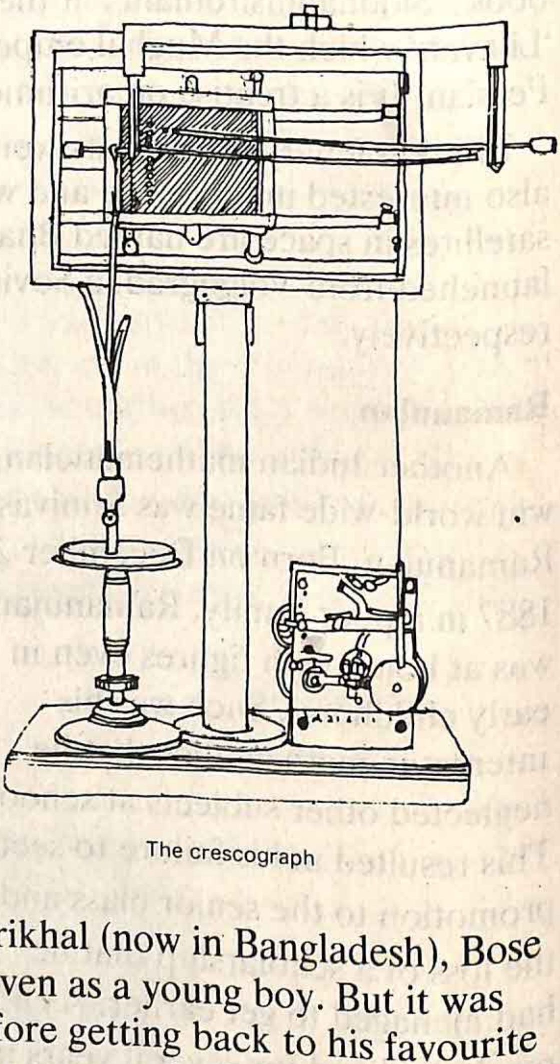
Ramanujan's early death at the age of 33 robbed the world of a mathematical wizard who had a lot more to contribute to the subject.

J.C. Bose

Sir Jagdish Chandra Bose was one of the most brilliant scientists of India. He won international acclaim when he invented the crescograph with which one could measure growth and movement in plants.



Jagdish Chandra Bose

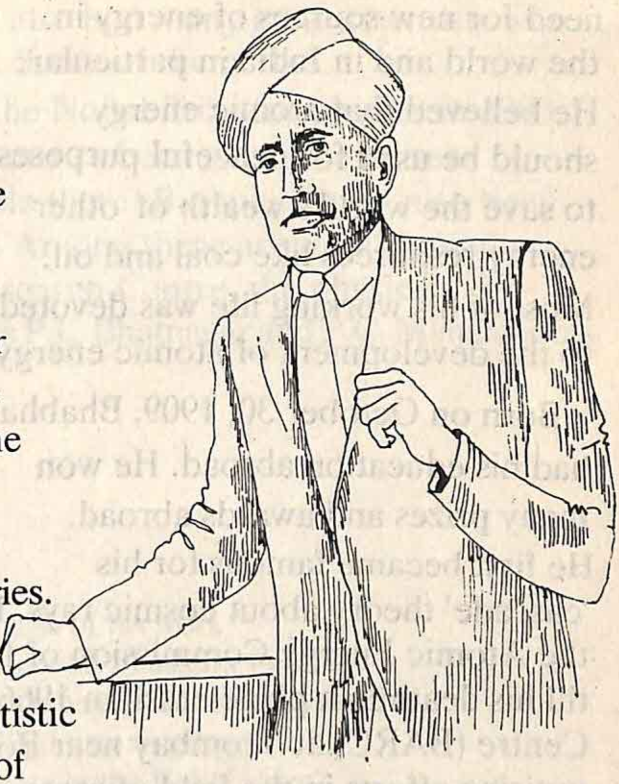


The crescograph

Born on November 30, 1858 at Rarikhal (now in Bangladesh), Bose showed keen interest in animal life even as a young boy. But it was physics that he studied in college before getting back to his favourite subject in later life. He studied radio waves and, along with other great scientists, he may be regarded as a pioneer in the field of wireless transmission. He proved his genius at a public lecture in Calcutta in 1895 when he made electric waves from a radiator in the hall travel 75 feet and provide, through a receiver, enough energy to ring a bell and fire a pistol.

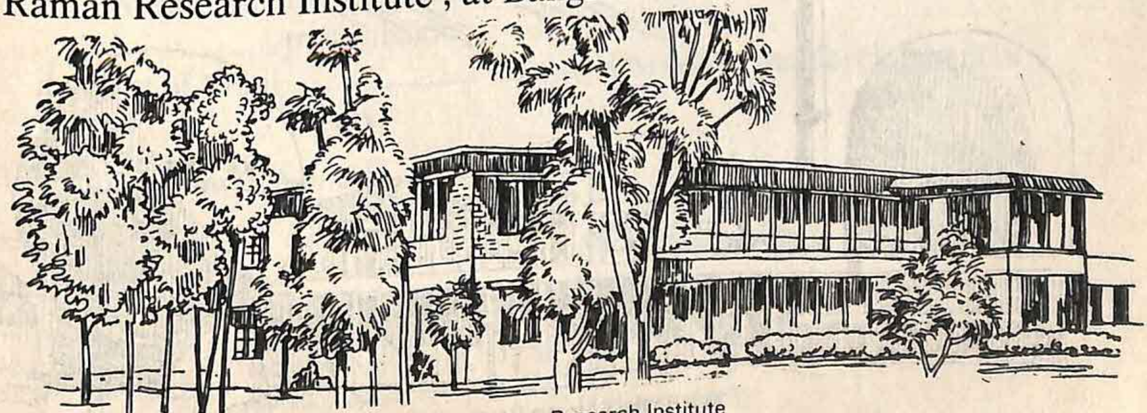
Bose was conferred a knighthood by the British government in 1916. He founded the Bose Research Institute in Calcutta in 1917. He died on November 23, 1937.

C.V. Raman


Sir C.V. Raman

Sir C.V. Raman was the first Indian scientist to be awarded the Nobel Prize. The 'Raman effect', as the result of his experiment is called, is considered to be a major breakthrough in the study of light. The instruments used by him, some of which were his own inventions, are essential equipment in research laboratories and also in some industries.

Born on November 7, 1888, Raman combined scientific and artistic interests by studying the working of various musical instruments like the violin, veena, tampura and mridangam. He started his career as a government officer but gave it up to take up research at the Calcutta University. He was knighted in 1929 and the next year he won the Nobel Prize. Like Sir J.C. Bose, he also founded an institute, the 'Raman Research Institute', at Bangalore in 1943.

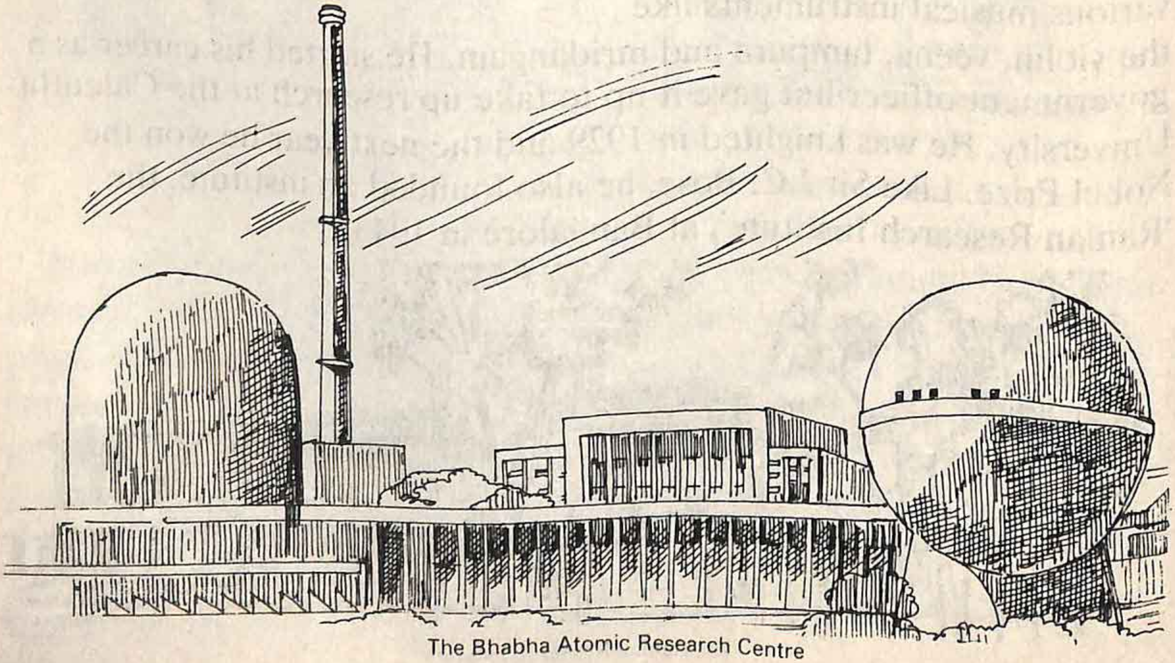

The Raman Research Institute

Homi J. Bhabha

Homi J. Bhabha

Homi Bhabha's concern was the need for new sources of energy in the world and in India in particular. He believed that atomic energy should be used for peaceful purposes to save the world's wealth of other energy resources like coal and oil. Most of his working life was devoted to the development of atomic energy.

Born on October 30, 1909, Bhabha had his education abroad. He won many prizes and awards abroad. He first became famous for his 'cascade' theory about cosmic rays. He was appointed Chairman of the Atomic Energy Commission of India in 1947, a post which he held till his death in a plane crash in 1966. The Bhabha Atomic Research Centre (BARC) at Trombay near Bombay is named after him for his untiring efforts in the field of atomic research.



The Bhabha Atomic Research Centre

Other eminent scientists

Since independence India has shown a great deal of progress in science and technology. We have also had many great scientists who have contributed to this progress. Some of them, like Dr. S. Chandrasekhar, who won the Nobel Prize for physics in 1983, have become citizens of other countries because of the better opportunities for research available there. But many have also been able to remain and work in India. Among these are Raja Ramanna who leads the Bhabha Atomic Research Centre, the physicist P.K. Iyengar and the mathematicians P.L. Bhatnagar and P.C. Mahalanobis.

Exercises

1. Answer briefly:
    - a. Who was Aryabhata? What is the title of his work?
    - b. Why were two of India's satellites named Bhaskara I and II?
    - c. Why did Ramanujan have to live in poverty for several years?
    - d. Who invented the crescograph? What was its purpose?
    - e. Who was the first Indian scientist to win the Nobel Prize?
    - f. What does BARC stand for? Who is it named after?

2. Fill in the blanks:

a. The first Indian satellite put into ____________ was named ____________ .
b. 'Lilavati' written by ____________ was translated into Persian because the Mughal emperor ____________ wished it.
c. Jagdish Chandra ____________ can be regarded as a pioneer in the field of ____________ transmission.
d. Most of Homi ____________ life was devoted to the development of ____________ energy.

3. Match columns A and B:

A	B
Aryabhata	Mathematician
J.C. Bose	Nobel Prize
Ramanujan	Atomic research
Homi Bhabha	Satellite
S. Chandrasekhar	Crescograph

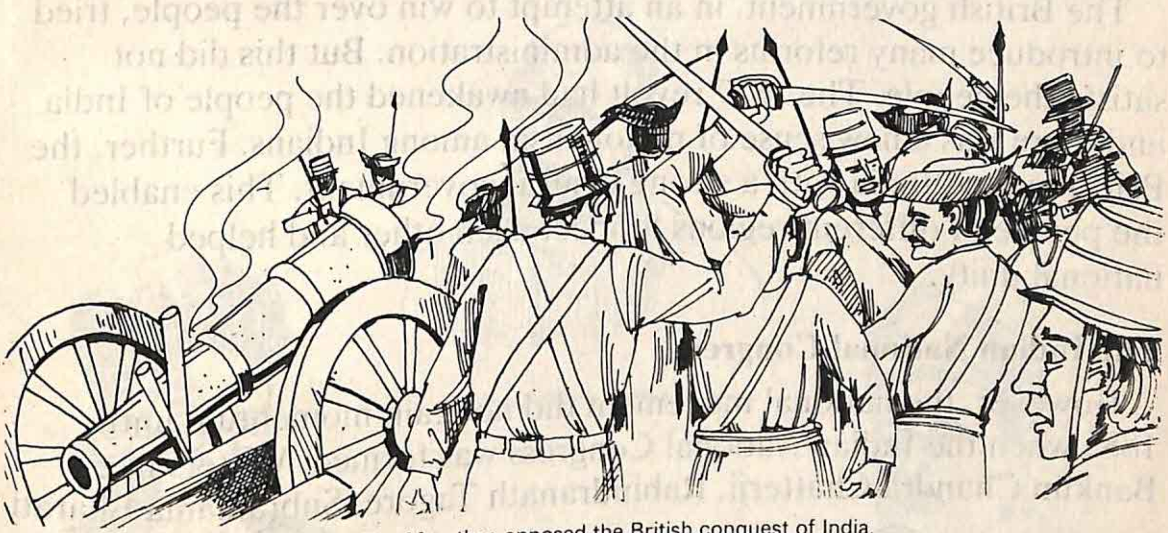
4. Correct the following:
   a. Aryabhata's works were translated into Persian by the Emperor Akbar.
   b. Ramanujan performed brilliantly in all subjects and won a scholarship to Cambridge.
   c. Jagdish Chandra Bose was a physicist all his life.
   d. The 'Raman effect' is related to the study of sound.
   e. Homi Bhabha devoted his life to research in energy sources like coal and oil.

Project work

India exploded a nuclear device some years ago. Find out where and when. In what way is this experimental explosion different from the atomic explosions set off by countries like the U.S.A., the U.S.S.R and France? Do you know what is meant by 'atoms for peace'?

19. Our freedom struggle

From the time the British landed in our country as tradesmen in the early 17th century, they tried to gain political and military control over various parts of India. They faced stiff opposition from some rulers like the Marathas and Tipu Sultan of Mysore. But gradually the East India Company, with the support of the British Crown, overran most of the Indian kingdoms and laid the foundation for the British Empire in India.



The Marathas opposed the British conquest of India.

The First War of Independence

The revolt of 1857 by Indian sepoys in the British Army was the first mass uprising against foreign rule. What started as a mutiny in the army soon spread among the people resulting in a general revolt. Some of the rulers under British control joined the sepoys. This revolt is now known as the First War of Indian Independence. Nana Sahib, Rani Lakshmi Bai of Jhansi and Tantya Tope were some of the prominent leaders who fought the British bravely. Rani Lakshmi Bai died on the battlefield fighting for her country's freedom. Tantya Tope, who tried to escape, was caught and hanged. After this war, the

Rani Lakshmi Bai

Tantya Tope

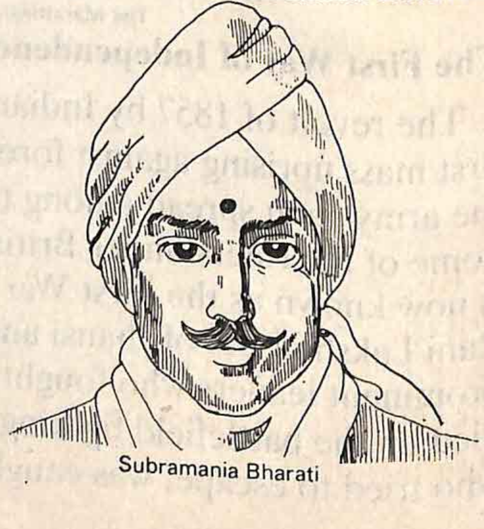
British Crown decided to take over control of the country from the East India Company. Thus India came under British rule in 1858.

The British government, in an attempt to win over the people, tried to introduce many reforms in the administration. But this did not satisfy the people. The 1857 revolt had awakened the people of India and there was a new sense of nationalism among Indians. Further, the British united India with a strong central government. This enabled the people of different regions to meet each other and helped national unity.

The Indian National Congress

However, the national movement did not gain momentum until 1885 when the Indian National Congress was formed. Writers like Bankim Chandra Chatterji, Rabindranath Tagore, Subramania Bharati

Rabindranath Tagore



Subramania Bharati

and Vishnu Shastri also aroused nationalistic feelings among the people with their writings.

The birth of the Indian National Congress, mainly through the efforts of an Englishman, Alan Octavius Hume, saw a change in the political situation in the country. The Congress tried to unite the people of different regions to instil in them a feeling of national unity. It also formulated popular demands and placed them before the government. The early leaders of the Congress like Dadabhai Naoroji, Pheroze Shah Mehta, Surendra Nath Bannerji, Gopal Krishna Gokhale and Ranade tried to maintain friendly relations with the British government. These leaders had faith in the British sense of justice and their demand was for self-government within the British Empire.

Surendra Nath Bannerji

Dadabhai Naoroji

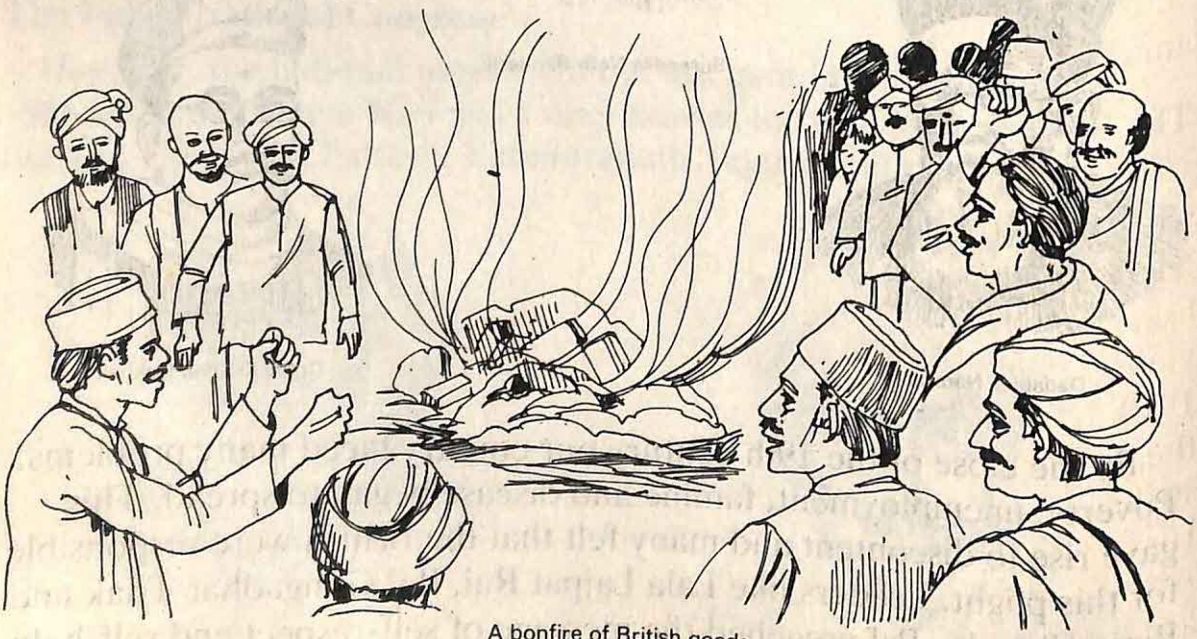
Gopal Krishna Gokhale

By the close of the 19th century our country faced many problems. Poverty, unemployment, famine and disease began to spread. This gave rise to discontent and many felt that the British were responsible for this plight. Leaders like Lala Lajpat Rai, Bal Gangadhar Tilak and Bipin Chandra Pal preached the message of self-respect and self-help.

They urged the people to be self-reliant and courageous and to fight the British for freedom. Since their approach was not in line with that of the Congress, they were called extremists. But they created a new sense of nationalism in the minds of the people and this gave an impetus to the national movement.

The partition of Bengal

The British were concerned about the growing national movement. They saw it as a threat to their rule. To weaken the movement, they split Bengal in 1905 on communal lines to create enmity between Hindus and Muslims. This divide and rule policy of the British did not defeat the nationalists. In August 1905, a huge protest meeting was held in Calcutta and they decided to boycott British goods, to use only swadeshi goods and to spread national education. The moderates and the extremists in the Congress worked closely together and launched the Swadeshi movement. Though the movement was started in Bengal, it soon spread to other parts of the country. Lawyers, students and women joined the movement in large numbers and made bonfires of British goods. Shops in all parts of the country selling foreign goods were picketed. At last, the British government yielded and revoked the partition of Bengal in 1911.



A bonfire of British goods

Meanwhile, the gulf between the moderates and the extremists in the Congress widened. The moderates demanded self-government in internal affairs and the extremists wanted complete freedom. The British took advantage of the situation by supporting the moderates and having the extremists arrested. The two sides united again in 1916 mainly due to the efforts of Mrs. Annie Besant, an Irish lady, who made India her home. The Congress also signed a pact with the Muslim League to strengthen the national movement.

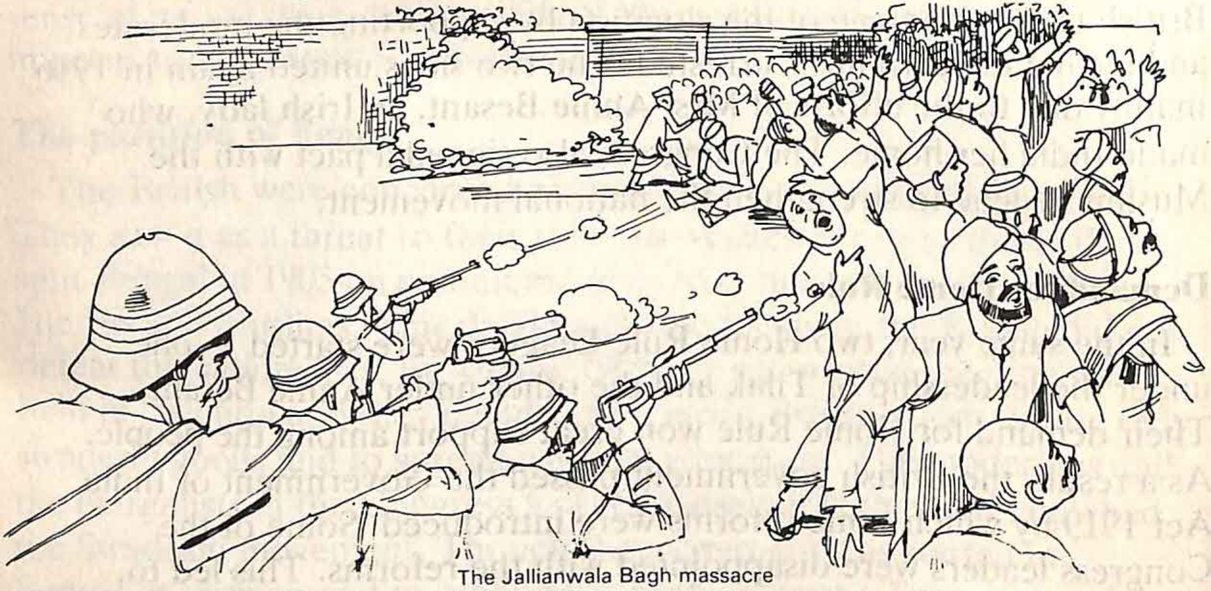
Demand for Home Rule

In the same year, two Home Rule Leagues were started – one under the leadership of Tilak and the other under Annie Besant. Their demand for Home Rule won great support among the people. As a result, the British government passed the Government of India Act 1919 by which some reforms were introduced. Some of the Congress leaders were disappointed with the reforms. This led to another split in the Congress because the moderates welcomed the reforms and the extremists rejected them. In this atmosphere of excitement, the British government introduced the Rowlatt Act which gave the government power to arrest and imprison anyone without warrant or trial. The act placed restrictions on civil liberties and this angered the public.

The Rowlatt Act and Jallianwala Bagh

Mahatma Gandhi's return to India from South Africa coincided with the introduction of the Rowlatt Act. Very soon he took over the leadership of the national movement and gave it a new turn. Gandhi asked the people to protest against the Rowlatt Act through non-violent methods. He gave a call for a country-wide hartal on April 6, 1919. It turned out to be a great success as millions of people all over the country responded to the call by holding demonstrations and strikes. The British government reacted to this by arresting Gandhi. His arrest was followed by disturbances in all parts of the country. At Jallianwala Bagh in Amritsar, thousands of people who had assembled there for a peaceful protest meeting were killed when

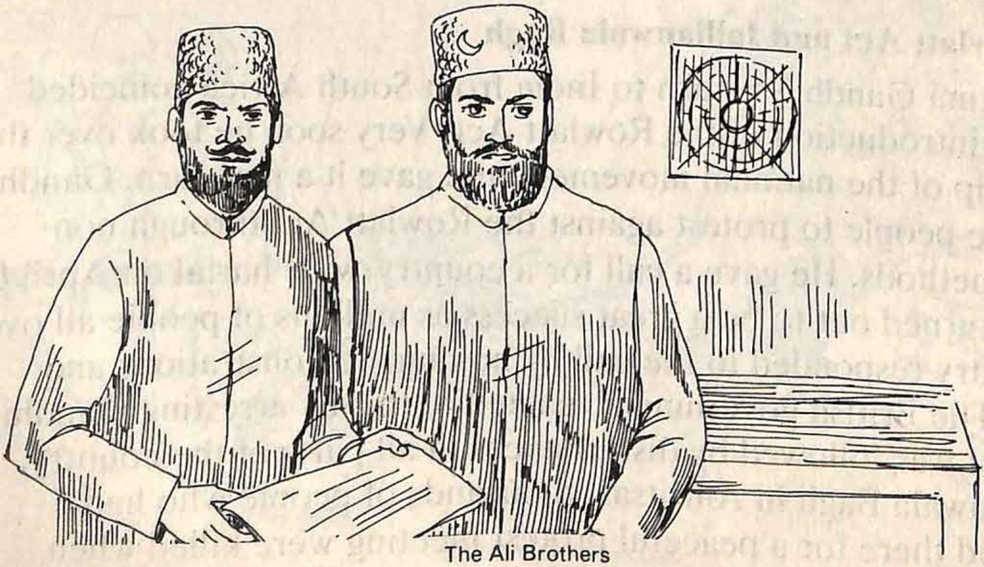
British soldiers surrounded the place and opened fire on the trapped people. This massacre made the people very angry and more determined to fight foreign rule.



The Jallianwala Bagh massacre

The non-cooperation movement

When Gandhi was released from jail, he decided to start the non-cooperation movement. Meanwhile the Muslims, under the leadership of the Ali brothers, had started the Khilafat movement protesting against the British government's decision to abolish the office of the Khalifa of Turkey. Gandhi supported this movement and as a



The Ali Brothers

result he became the leader of both Hindus and Muslims. Muslims also joined the non-cooperation movement which consisted of the boycott of legislative councils, government schools and colleges, law courts, foreign goods, government functions and the surrender of titles and distinctions.

Gandhi launched the movement in 1920 after he toured the country explaining his programme. Hundreds of lawyers gave up their legal practice, thousands of students left their schools and colleges and many Indians returned their degrees and titles. Most of the leaders were arrested and jailed. The government took repressive measures

Gandhi launched the non-cooperation movement in 1920.

An angry crowd attacked a police station.

and opened fire on a procession of peasants at Chauri Chaura, a village in Uttar Pradesh. This enraged the crowd and they attacked a police station killing 22 policemen. This incident saddened Gandhi who had asked the people to adopt non-violent methods. He called off the movement.

Leaders like Motilal Nehru, Lala Lajpat Rai and C.R. Das were shocked at Gandhi's decision to call off the agitation. In 1923, they formed the Swarajya Party and decided to work as a group within the Congress. Their party did well in the elections in 1923. They demanded dominion status for India and when the British refused to accept their demand, they walked out of the Central Assembly. When the British government sent a commission (the Simon Commission) to look into the question of further reforms, it was greeted with black flag demonstrations. At Lahore, the demonstration was led by Lala Lajpat Rai. The police resorted to a lathi charge in which Lala Lajpat Rai was seriously injured. He died on November 17, 1928. The commission did not recommend dominion status in its report to the government.

Motilal Nehru

Lala Lajpat Rai

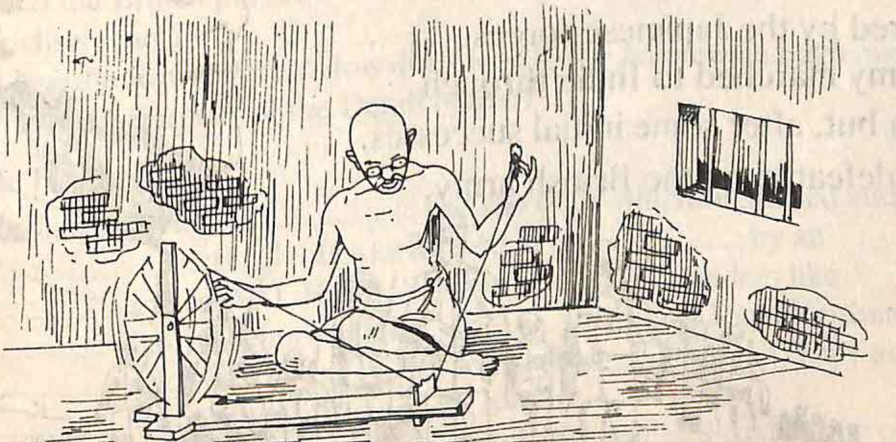
The Dandi march

On March 12, 1930, Gandhi undertook his famous Dandi march to mark the beginning of the civil disobedience movement. He marched to Dandi, a village in Gujarat, and made salt from sea-water, thereby breaking the government's salt laws. Thousands of people joined him on his march. The movement gained momentum with people in all parts of the country making salt and breaking the law. Once again, the

The Dandi salt satyagraha

government tried to crush the movement with repressive measures like lathi-charge and firing. Most of the leaders including Gandhi were arrested and put behind bars.

The British government then summoned Indian leaders to the First Round Table Conference in London to reach an agreement. But the Congress decided to boycott the Conference. Finally, in March 1931, an agreement was reached between Gandhi and Lord Irwin. Gandhi called off the movement to attend the Second Round Table Conference. The meeting was a failure and Gandhi returned to India to resume the movement. Once again Gandhi and other leaders were arrested. The civil disobedience movement was withdrawn in 1934 after some reforms were introduced.



Gandhi was arrested and imprisoned.

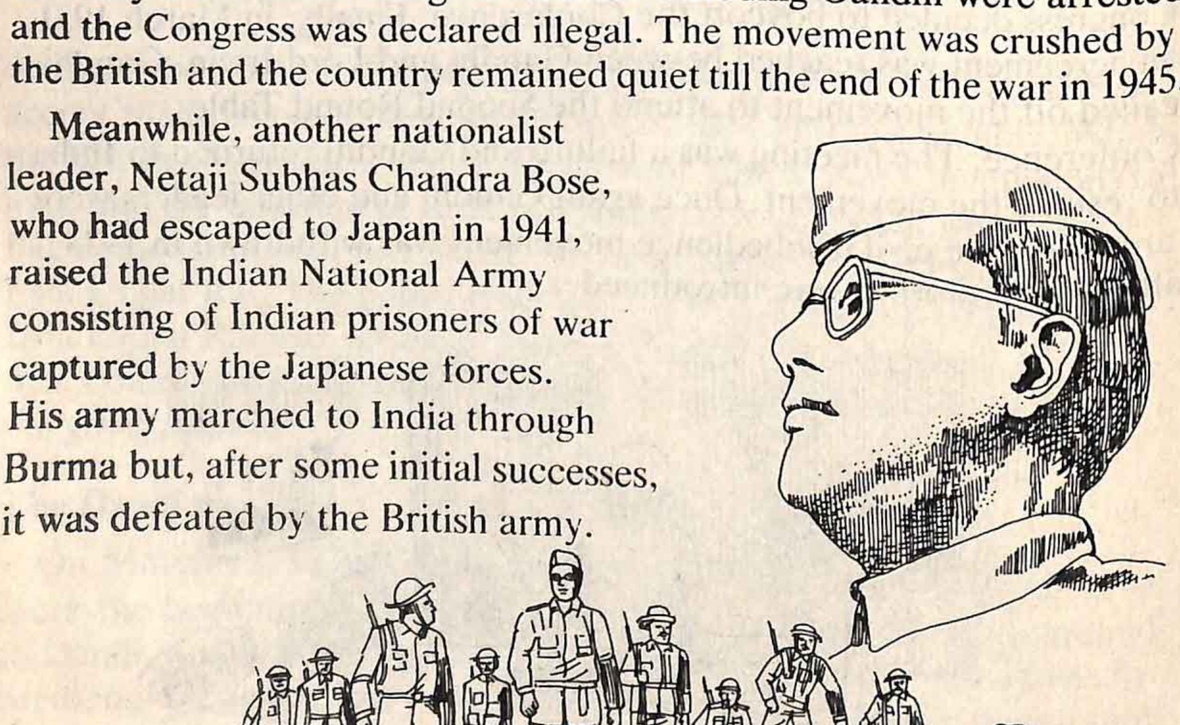
The British government introduced the Government of India Act, 1935, which gave very limited powers, to the provincial governments. Though the Congress was in control of the governments in seven of the 11 provinces, the British Governors of these provinces had powers to overrule any decision of the governments.

The Congress leaders demanded complete freedom when the Second World War broke out in September 1939, so that India may participate in the war as a free country. The Congress ministries resigned from the provincial governments when the British refused their demand. In this period also, the Muslim League under Muhammed Ali Jinnah demanded a separate country called Pakistan, for Muslims.

Quit India

The Indian National Congress passed the Quit India resolution on August 8, 1942. It planned to launch a non-violent mass struggle. The next day most of the Congress leaders including Gandhi were arrested and the Congress was declared illegal. The movement was crushed by the British and the country remained quiet till the end of the war in 1945.

Meanwhile, another nationalist leader, Netaji Subhas Chandra Bose, who had escaped to Japan in 1941, raised the Indian National Army consisting of Indian prisoners of war captured by the Japanese forces. His army marched to India through Burma but, after some initial successes, it was defeated by the British army.



Subhas Chandra Bose

Freedom and partition

After the Second World War ended, the British realised that they would have to grant freedom to India. In February 1947, the British declared that they would leave India by June 1948. Communal riots between Hindus and Muslims broke out in many parts of the country. The Muslims wanted a separate state of Pakistan.

In March 1947, Lord Mountbatten took over as the last British Viceroy of India. After long discussions with the Congress and Muslim League leaders, he proposed that the country should be split into India and Pakistan. Gandhi's efforts to keep the country united were futile and the Congress accepted Lord Mountbatten's suggestion.

The Indian Independence Act was passed by the British government in July 1947 granting complete freedom to India but the country was split into two. India became free on August 15, 1947. Every year, we celebrate this day as our Independence Day.

Exercises

1. Answer briefly:
   - a. What is the mutiny of 1857 now called?
   - b. Who founded the Indian National Congress and when?
   - c. Who were the leaders who were called 'extremists'? Why?
   - d. How did the British pursue a 'divide and rule' policy in 1905? How did the nationalists react?
   - e. What was the Rowlatt Act? How did it lead to the Jallianwala Bagh massacre?
   - f. What was the purpose of the Dandi march?

2. Fill in the blanks:
   - a. The Indian National __________ was the body which organised and led our __________ struggle. It was formed in __________ by an __________ called A.O. Hume. The early Congress leaders like __________ Naoroji, Pheroze Shah __________ and Gopal Krishna __________ had faith in the British sense of __________. They asked for __________ within the __________ Empire.
   - b. After the Second __________ War, the British realised that they would

have to grant __________ to India. When they declared that they would leave __________ by __________ __________, __________ riots broke out between Hindus and __________. The __________ wanted a separate state of __________.

3. Tick the correct sentences. Correct those that are incorrect:
   a. The revolt of 1857 was a mutiny in which only the sepoys took part.
   b. The Indian National Congress was founded by a group of Indians.
   c. Lala Lajpat Rai and Tilak were called extremists because their views differed from the views of others in the Congress.
   d. The Rowlatt Act introduced many humanitarian reforms.
   e. The Congress leaders agreed that they would not ask for independence till the Second World War was over.
4. Match columns A and B:

A

Tantya Tope
A.O. Hume
Lala Lajpat Rai
Ali brothers
Muhammad Ali Jinnah

B

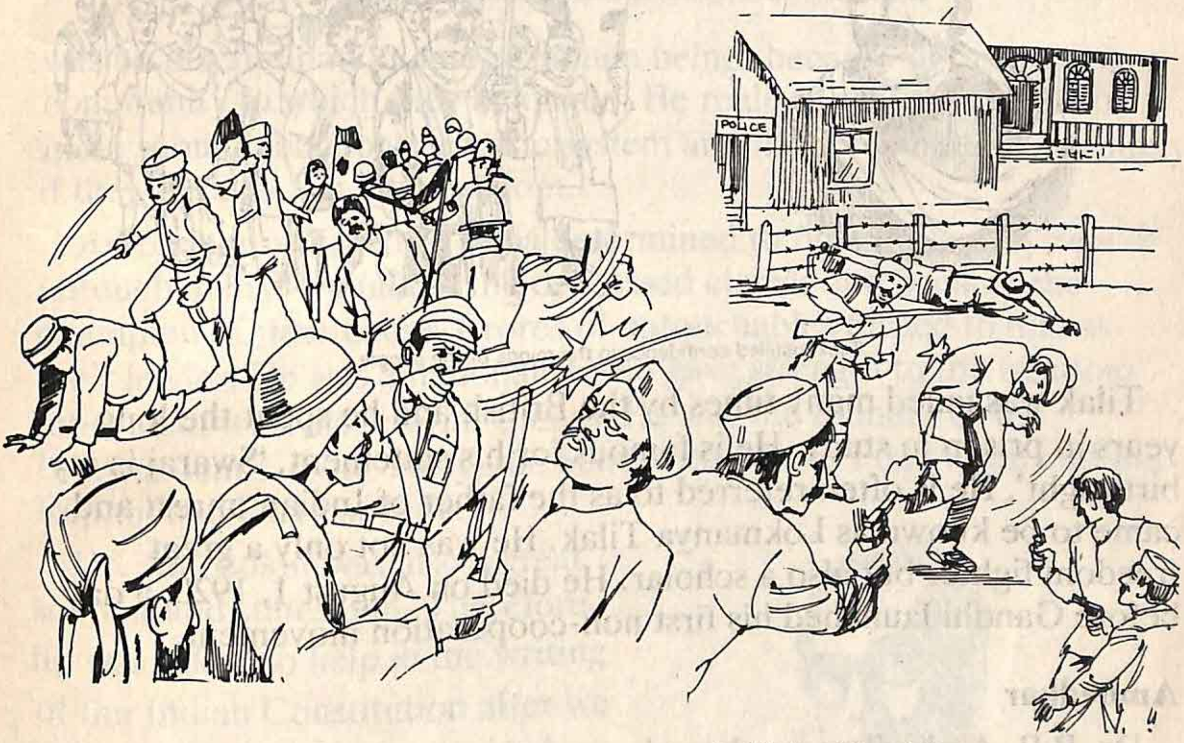
started Khilafat movement
was called an extremist
fought the British in 1857
asked for separate Pakistan
founded Indian National Congress

Project work

On an outline map of India, mark the places where important events in our freedom struggle took place. Example: Dandi. Your teacher will help you find out more about the freedom struggle and the places you should mark. Name each such place and write under it the date on which the important event happened.

20. Some heroes of the freedom struggle

Our struggles for freedom — from the First War of Independence, to 1947 — witnessed many brave deeds by courageous men and women. There were different opinions about the way to gain freedom. While some people believed that violence was necessary to achieve their goal, others followed the path of non-violence preached by Mahatma Gandhi. Nevertheless, though their attitudes were different, all of them had only one objective in mind and that was to free the country from foreign rule.

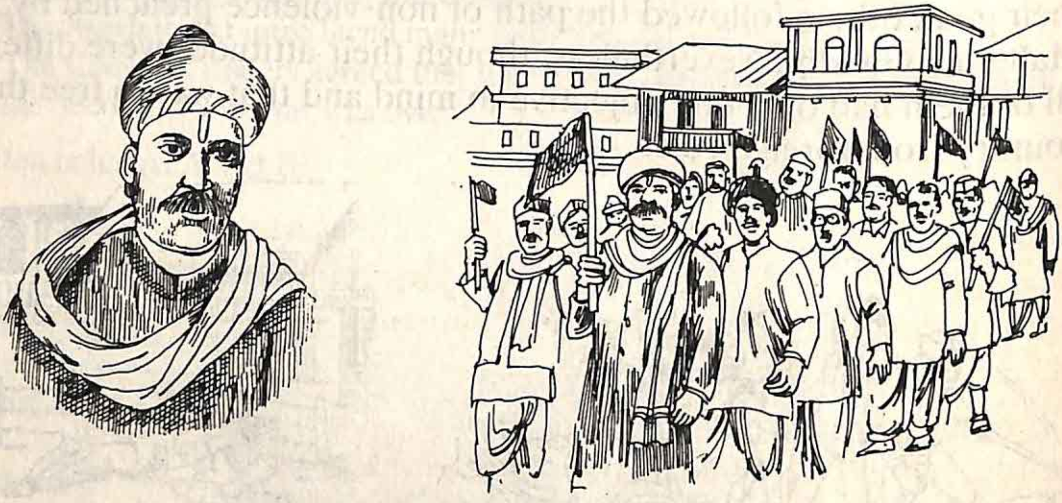


Some of our freedom fighters followed the non-violent path; others believed that violence was necessary.

Bal Gangadhar Tilak

One of the early stalwarts of the Independence struggle was a young man from Maharashtra. His name was Bal Gangadhar Tilak. Born on July 23, 1855, Tilak was a brilliant student. Even as students, he and his friends took part in the freedom struggle. They first tried to educate the masses and instil in them a spirit of nationalism.

Tilak started two newspapers, 'The Kesari' in Marathi and 'The Maratha' in English, to promote nationalism among the people. Through his newspapers, he instilled confidence and strength in the minds of the people in their fight for freedom. He also organised religious festivals in Maharashtra to bring people together and to remind them of their rich cultural heritage. He fought the British in his own way. His methods did not conform to those of some other leaders in the Congress and he was called an extremist.



Tilak instilled confidence in the minds of the people.

Tilak was jailed many times by the British and he spent the long years in prison in study. He is famous for his statement, 'Swaraj is my birthright'. He is often referred to as the father of Indian unrest and came to be known as Lokmanya Tilak. He was not only a great freedom fighter but also a scholar. He died on August 1, 1920, a day before Gandhi launched his first non-cooperation movement.

Ambedkar

Dr. B.R. Ambedkar was born in a community which was considered to be 'untouchable'. At school, he was not permitted to sit with other students or drink water from the pot that was used by others. He was humiliated many times not only by his classmates but also by his teachers. But one Brahmin teacher took a liking to him and this gave him moral courage. He completed his studies in India and went abroad for higher education. In foreign countries, he saw that there

At school, Ambedkar suffered humiliation as an 'untouchable'.

was no discrimination among human beings because of the caste or community to which they belonged. He realised that the people of India should abandon the caste system and live in communal harmony if they were to win real freedom.

Ambedkar returned to India determined to fight the evil system of untouchability. He united the oppressed classes and became the champion of their cause. Crores of untouchables turned to him as their leader. He was a nationalist who gave strength to the freedom movement with his reformist ideas. He was the founder of the Independent Labour Party, the Scheduled Castes Federation and the Republican Party of India.

Dr. Ambedkar was also a great scholar and statesman. Therefore he was asked to help in the writing of the Indian Constitution after we gained freedom. He is regarded as the chief architect of the Constitution and a builder of modern India. He died on December 6, 1956, after having dedicated his life to the uplift of the downtrodden.

Dr. B.R. Ambedkar

Subhas Chandra Bose

Subhas Chandra Bose holds a unique position in the history of our freedom struggle in that he was the only Indian who raised an army of about 75,000 men and women to fight the British.

Born on January 23, 1897, Bose did very well in his studies and went to England for higher education. Even as a student, Bose resented foreign rule. Once he organised a student strike to protest against the rude behaviour of an English professor. He was expelled from college for this.

After his return from England, Bose became Principal of the National College at Calcutta but soon gave it up to join Mahatma Gandhi's non-cooperation movement. He joined Swarajya, a party formed by C.R. Das and Motilal Nehru. He was arrested many times and sent to prison in Burma. On each occasion he was released on grounds of health. He went to England for medical treatment and used such opportunities to mobilize public support for India's freedom struggle in foreign countries.

Bose was arrested and sent to prison many times.

Bose, who later joined the Indian National Congress, was twice its President. He resigned from the post when his views regarding the way to gain freedom were not liked by many leaders. He formed a new party, the Forward Bloc, and functioned within the Congress.

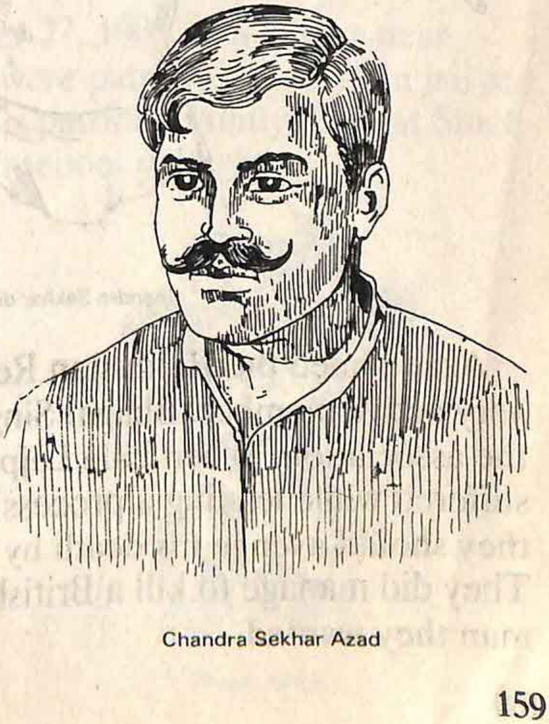
In 1940, Bose was arrested again but escaped in disguise. He went to Germany and Japan and sought their support against the British. It was in Japan and Burma that he raised the Indian National Army. The INA fought the British on the Indo-Burma border. Though the army was successful initially, it was defeated by the British.

The INA fought the British on the Indo-Burma border.

On August 18, 1945, Bose boarded a Japanese aircraft for Tokyo. But on the way, the aircraft met with an accident and Bose is believed to have died in the accident.

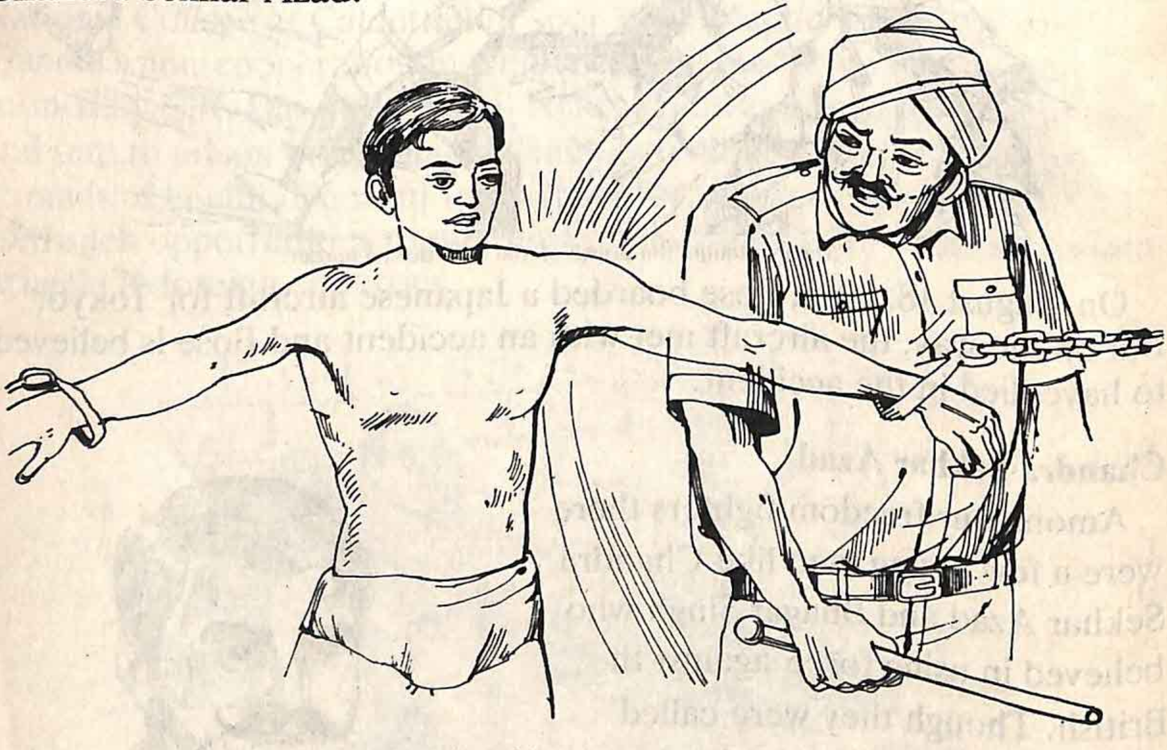
Chandra Sekhar Azad

Among our freedom fighters there were a few young men like Chandra Sekhar Azad and Bhagat Singh who believed in using force against the British. Though they were called 'terrorists' by the British, they were popular with the people who admired their patriotism and their courage.


Chandra Sekhar Azad

Chandra Sekhar was born in 1906 in Bhamura, a village in Madhya Pradesh. He grew up to be a strong and intelligent boy. He made friends with the Bhils, a tribal people, and learnt to shoot an arrow accurately. He ran away from home to Bombay and later to Varanasi where he took up his studies.

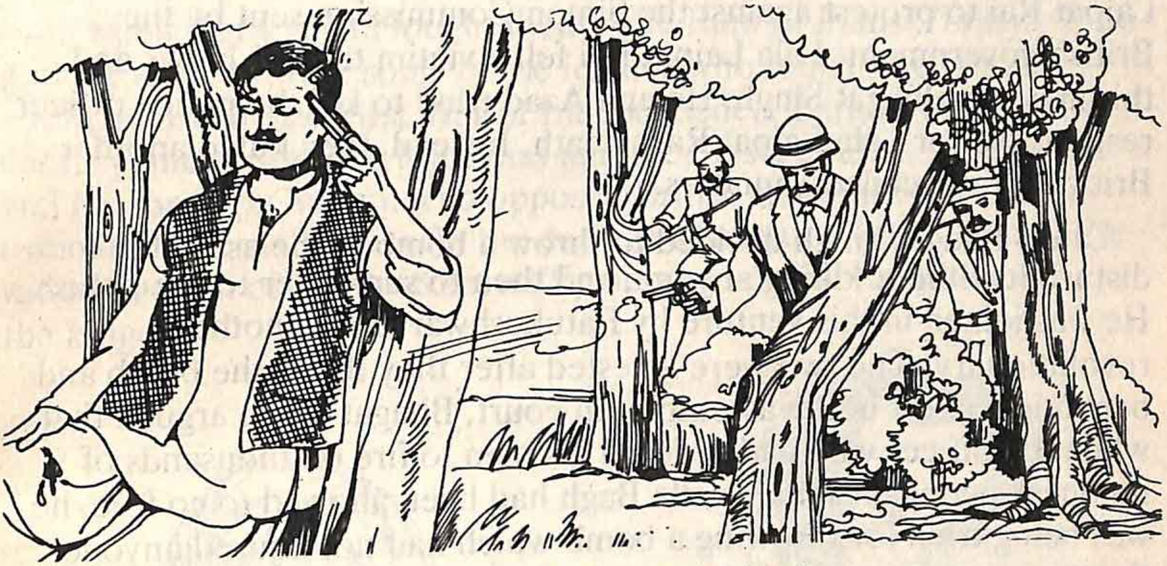
One day, he joined a procession of young revolutionaries and was arrested. Since Chandra Sekhar was a young boy, the magistrate ordered the police to cane him and let him off. Chandra Sekhar did not flinch once when he was caned. Later, when people came to know of this, they praised his courage. On that day, Chandra Sekhar declared that he would never again be arrested and that he would always remain 'Azad' (free). That is how he came to be known as Chandra Sekhar Azad.



Chandra Sekhar did not flinch when he was caned.

Azad joined the Hindustan Republican Association and became a very active member. Bhagat Singh was another prominent member of the association. When Lala Lajpat Rai died as a result of lathi injuries suffered while leading a procession, Azad and Bhagat Singh felt that they should avenge his death by killing the police officer responsible. They did manage to kill a British police officer, but he was not the man they wanted.

After Bhagat Singh's death in 1931, Azad continued with his work. But many members of the association had become traitors. One of them led the police to Azad's hideout and he was trapped. But before the police got him, he shot himself dead, keeping his promise that he would never be arrested alive.



Azad shot himself when trapped by the police.

Bhagat Singh

Bhagat Singh was born on September 27, 1907, in a village near Lahore. His father and his two uncles were patriots and were in jail at the time of his birth. Growing up in this patriotic family, Bhagat Singh also decided to devote himself to the freedom struggle.

The Jallianwalla Bagh massacre in Amritsar left a lasting impression on Bhagat Singh and his longing to liberate the country from British rule increased. He too, like Azad, believed in using violence for this purpose. He met Azad and the two of them worked closely in organising a group of revolutionaries to attack the British.

Bhagat Singh

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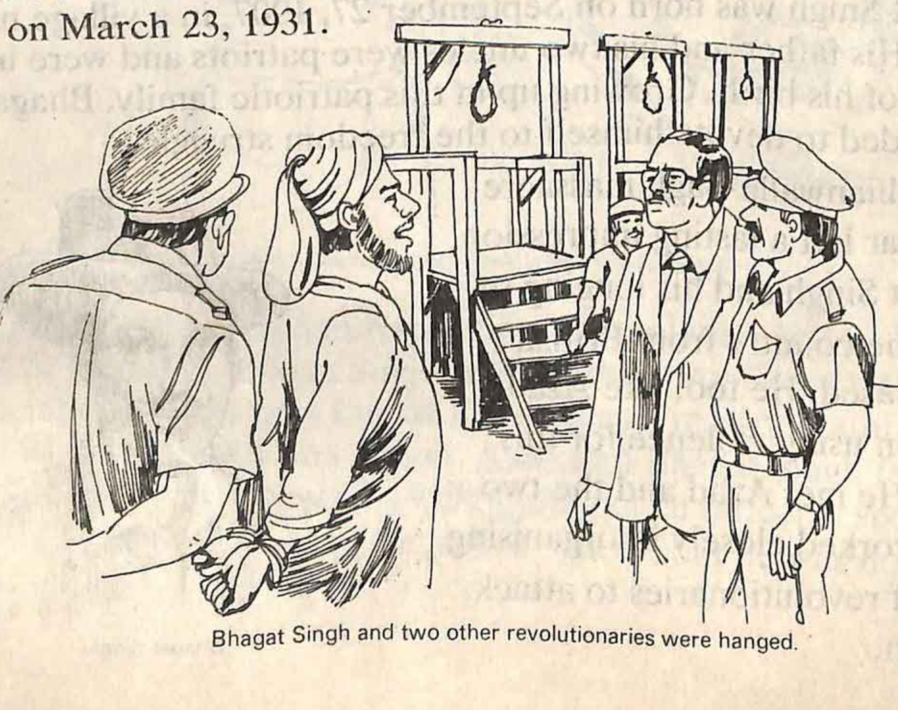
Bhagat Singh

As a boy, Bhagat Singh had acted in many plays to arouse nationalist feelings among the people. He and his friends made many daring attempts to educate the Indian public on the need for freedom. He avoided arrest on many occasions by disguising himself.

Once, in Lahore, Bhagat Singh joined a procession lead by Lala Lajpat Rai to protest against the Simon Commission sent by the British government. Lala Lajpat Rai fell a victim to lathi blows and this angered Bhagat Singh. He and Azad tried to kill the police officer responsible for Lala Lajpat Rai's death. Instead, they killed another British officer called Saunders.

Later, Bhagat Singh decided to throw a bomb in the assembly to disturb it without killing anyone, and then to surrender to the police. He was joined in this venture by Batukeshwar Dutt, another revolutionary. The two were arrested after they threw the bomb and patriotic leaflets in the assembly. In court, Bhagat Singh argued that while the officer who had ordered his men to fire on thousands of innocent people at Jallianwalla Bagh had been allowed to go free, he was being tried for throwing a bomb which had not injured anyone. But the court sentenced him to imprisonment. Meanwhile, Bhagat Singh was also tried for Saunders' murder and found guilty. He, along with two other revolutionaries, was sentenced to death. They were hanged on March 23, 1931.



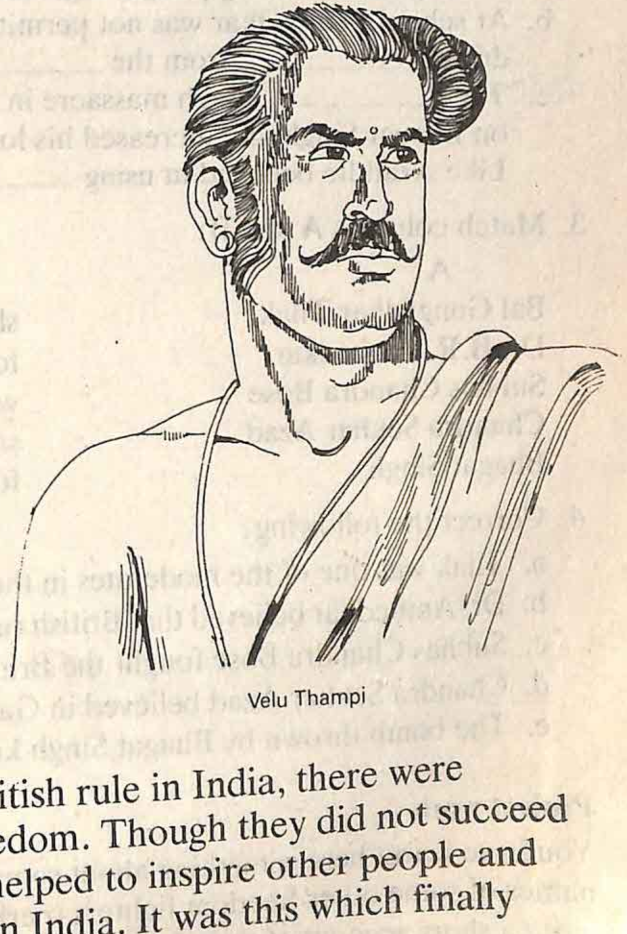
Bhagat Singh and two other revolutionaries were hanged.

Other freedom fighters

Though our struggle for freedom gained momentum only in the late 19th century, there were many people who opposed British rule or control over various parts of the country, even earlier.

In 1857, the British experienced large-scale opposition for the first time when many rulers fought them. The Rani of Jhansi, Tantya Tope and Nana Sahib were some of the leaders who fought the British courageously in the First War of Independence. Earlier, in the 18th century, there were the Marathas and the Mysore rulers, Hyder Ali and his son Tipu Sultan, who opposed British supremacy or control over their internal affairs. In the early 19th century Velu Thampi, the valiant Dewan of Travancore, stiffly opposed British takeover of the kingdom.

Hyder Ali



Velu Thampi

So, throughout the period of British rule in India, there were several people who fought for freedom. Though they did not succeed in their own lifetime, all of them helped to inspire other people and build up the spirit of nationalism in India. It was this which finally made it possible for the country to win independence.

Exercises

1. Answer briefly:
   a. Which were the two newspapers started by Tilak? In what languages did he publish them?
   b. Name the three organisations founded by Dr. Ambedkar.
   c. What was the work Dr. Ambedkar was asked to do after India gained freedom?
   d. What was the name of the army formed by Subhas Chandra Bose? Where did this army fight the British?
   e. How did Chandra Sekhar come to be called 'Azad'?
   f. What was the action which led to Bhagat Singh's arrest?
2. Fill in the blanks:
   a. Tilak used his two __________ to instil confidence and strength in the minds of the people. He also organised __________ __________ in Maharashtra to bring people together.
   b. At school, Ambedkar was not permitted to sit with other __________ or drink __________ from the __________ that was used by others.
   c. The __________ Bagh massacre in __________ made a lasting impression on Bhagat Singh and increased his longing to fight for India's __________. Like Azad he believed in using __________ for this purpose.
3. Match columns A and B:

A	B
Bal Gangadhar Tilak	shot himself to avoid arrest
Dr. B.R. Ambedkar	fought the British with Japanese help
Subhas Chandra Bose	was hanged by the British
Chandra Sekhar Azad	said: 'Swaraj is my birthright'
Bhagat Singh	fought against the caste system

4. Correct the following:
   a. Tilak was one of the moderates in the Congress.
   b. Dr. Ambedkar believed that British rule was the only evil to be fought in India.
   c. Subhas Chandra Bose fought the British on Indian soil throughout his life.
   d. Chandra Sekhar Azad believed in Gandhi's non-violent methods.
   e. The bomb thrown by Bhagat Singh killed several persons in the assembly.

Project work

You have learnt here something about some of our freedom fighters. Find out the names of some other freedom fighters (perhaps from your own home state) and write a short account of their lives and activities.

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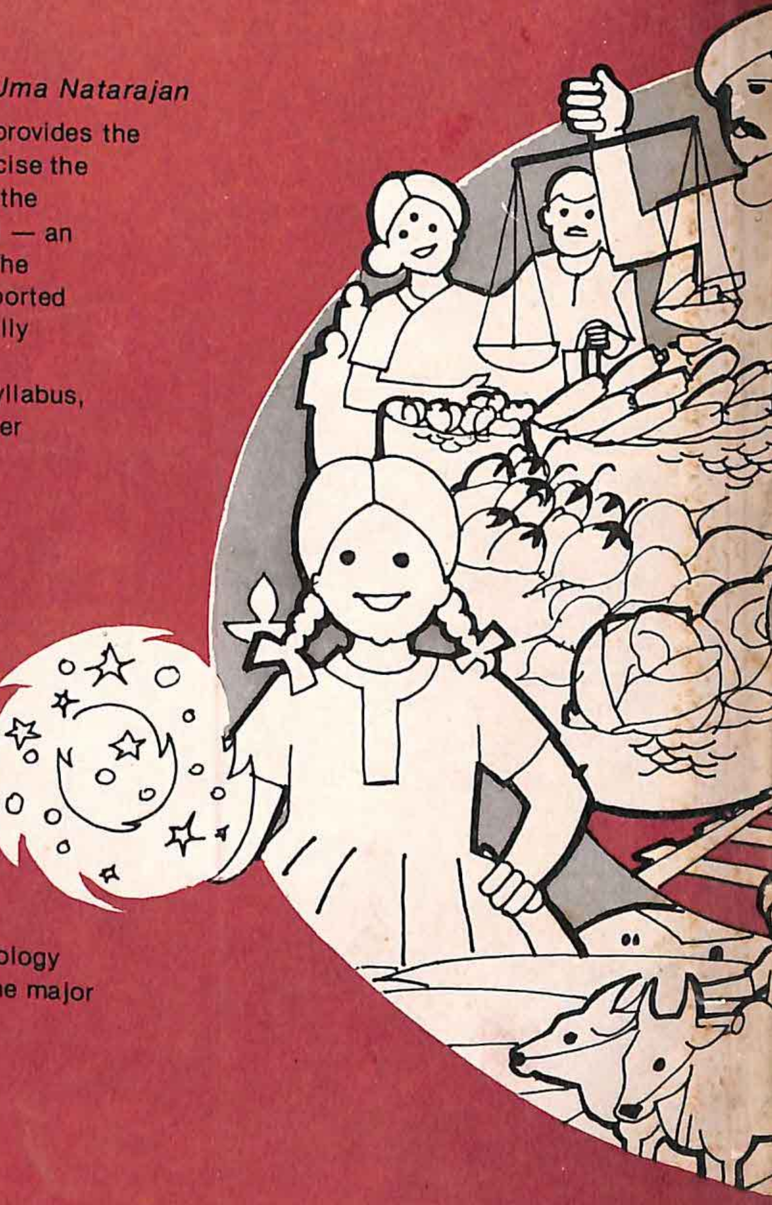

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